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ABSTRACT

The overall purpose of this project was threefold: (1) to gather task descriptive data concerning engagement rates of students across grade levels, abilities, classrooms, contextual factors, subject areas and task structures; (2) to link various teacher behaviors with student engagement rates, focusing on correlational results between a number of high inference variables and engagement rates of four different student ability groups across subject areas and grade levels; and (3) to integrate these findings into several theories (the teaching learning models fo Bloom, Harnischfeger and Wiley, and Carroll) which explained or predicted the observational data. Observational data were gathered from eight schools, grades two through six, through approximately 500 full day observations spaced equally throughout a school year. Observers recorded high inference data about the teaching behaviors and low inference data concerning student engagement rates. In addition, the observations recorded the detailed sequencing of teacher activities, coupled with every third minute recordings of engagement rates of four different ability students in various activity structures, subject areas, and grouping arrangements. The dependent measures included the Iowa Tests of Basic Skills, an aptitude measure for entering students, and Des Moines Public Schools subject area tests in language arts, mathematics, and social studies. (Author/PN)

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STUDENT ACADEMIC ENGAGEMENT RATES

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Des Moines Public Schools

February, 1983

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Final Report of
National Institute of Education

TM 840 156

Student Academic Engagement Rates

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February, 1983

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Final Report of National Institute of Education Grant NIE-G~~-0-0892~~

ABSTRACT

Within the last ten years a growing number of researchers have reported a significant relationship between student academic rates and subsequent achievement. Indeed, recent investigations reported that student engagement rates, and thus achievement, could be altered by changing the teacher's instructional behavior. Prior to this study, however, little was known, about the influence of contextual and aptitude factors on the engagement rates of pupils. The primary purpose of this project was to fill many of the gaps in the research base by gathering descriptive data concerning engagement rates of students across grade levels, abilities, classrooms, contextual factors, subject areas and task structures. The second purpose of this study was to begin to link various teacher behaviors with student engagement rates. In particular, this aspect of the study focused on correlational results between a number of high inference variables and engagement rates of four different student ability groups across subject areas and grade levels. The third portion of this study focused on an exploration of the causative pathways in the teaching learning models of Bloom, Harnischfeger and Wiley, and Carroll. The interest in this section was to investigate the basic elements each of the three models share in common to see if some empirical data could be added to the theoretical models that they have generated. To answer these three basic questions, observational data was gathered from eight different schools, grades two

through six, through approximately 500 full day observations spaced equally throughout a school year. Observers recorded high inference data about the teaching behaviors and low inference data concerning student engagement rates. In addition, the observations recorded the detailed sequencing of teacher activities, coupled with every third minute recordings of engagement rates of four different ability students in various activity structures, subject areas, and grouping arrangements. The dependent measures were represented by the Iowa Test of Basic Skills which served as a covariant and measure of entering student aptitude and three subject area tests developed within Des Moines public schools in language arts, mathematics and social studies. In addition, students completed a series of attitude measures to gather some descriptive data regarding their preferences, beliefs and other general attitude factors.

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I. INTRODUCTION

The importance of instructional time as a mediating variable in instruction and achievement has received new attention in recent years. The formulation of a model of school learning by Carroll (1963) is frequently credited as the stimulus for the current interest, although there have been prior and subsequent theoretical formulations and variations (Bloom, 1974, 1977; Dahlof, 1971; Walberg, 1970; Wasburn, 1925; and Tyler, 1962).

Recent studies involving time can be sorted into two categories: time as a specific unit of measure (years, months, days, hours, minutes) and time usage in relation to curriculum and instructional concerns. The first category is represented by the studies of Hyman, Wright, and Reed (1975) and Harnquist (1977) in their examination of the enduring effects of education in relation to years of schooling. In the second category, time is examined descriptively within curriculum and instructional context and can, in turn, be further subdivided into three bodies of research: (1) general classroom research, (2) instructional time research, and (3) attention research. The works of Harris and Serwer in the CRAFT project, Stallings and Kaskowitz (1974) with the Follow Through Evaluation, and McDonald and Elias' (1976) in the Beginning Teacher Evaluation Study (BTES) typify the investigations carried out under the generic term of general classroom research. In almost all cases these research projects have involved the collection of vast amounts of data followed by post hoc analysis looking for variables or clusters of variables that show significant correlations with post- test measures. Several researchers have specifically focused their efforts upon the investigation of instructional time and represent the second body of research. Kidder, O'Reilly and Kiesling's (1975) examination of the quantity of instruction in compensatory reading programs, Good and Beckerman's (1978) work in elementary mathematics; the reports of Fisher, Filby and Marliave (1977), and Fisher, et al (1976a, 1976b) utilizing the BTES data; and the general research of Bloom (1977), Harnischfeger and Wiley (1978) and their students represent typical examples of this line of investigation. The third body of research focuses on the effect of student attention (engagement time) on student achievement. The general methodology of these studies (e.g., Lahaderne, 1968; Cobb, 1972; Schultz, 1973; and Samuels and Turnure, 1974) has been to observe the students over discrete time intervals and to correlate this engaged time with some measure of academic achievement.

The attractiveness of this time on task research probably stems not from the fact that engaged time is a better measure of achievement than tests, clearly it is not, but rather that time is an overt behavioral indicator of ongoing learning. If involvement in learning activities is highly correlated with achievement, as some researchers have indicated (Anderson, 1975 ; Arlin and Roth, 1978; Bloom, 1974; Cooley and Leinhardt, 1978;

Fisher, et al, 1978; Samuels and Turnure, 1974; and Stallings and Kaskowitz, 1974), then time on task serves as an unobtrusive measure of instructional effectiveness which affords the teacher immediate feedback on the effectiveness of the ongoing instructional activities. Equally important is that schools and teachers have substantial control over time allotments (unlike many socioeconomic variables), and therefore, have the potential of increasing student achievement with minimal expenditures.

Although the relationship between pupil engaged time and achievement has been amply documented, many contextual factors influencing engaged time remain largely unexplored. First, most of the time on task research has focused on instruction in basic skills, usually defined as reading and mathematics. Although this emphasis seems justified as the learning of basic skills is clearly a major purpose of schooling, most educators are also interested in other academic areas. Interestingly, the few studies which have investigated student engagement rates across subject areas have discovered substantial differences. For instance, Cornbleth and Korth (1979) reported that overall, those subject areas having more allocated time (language and mathematics) showed proportionately less student engagement time. A possible implication of this work is that further increasing allocated time in language and mathematics might have a negligible effect on involved time. Indeed, it might be more productive to better utilize existing allocated time through the use of different types or patterns of academic activities.

The second area in which reported research is lacking is the relationship among subject area, engaged time, and days of the week. Although it seems reasonable to expect that pupil engaged time would be greatest in mid-week with less involved time at the beginning and at the end of the week, recent research indicates no such clear relationship exists. In particular, Cornbleth and Korth (1979) found that the day of the week was differentially related to involved time, depending upon the subject area. Although these preliminary findings suggest that teachers should plan activities that would capitalize on these differential engagement rates, research to date provides little prescriptive advice as to how a teacher could take advantage of these various contextual situations.

A third area involves the relationship between engaged time and the classroom learning format of academic activities (e.g., large group, small group, individual). It seems likely that pupil engaged time would be greater in large group activities, where the teacher can regularly monitor pupil behavior, than in small group or individual settings. Indeed, several studies (Fisher, et al, 1978; Gump, 1971; Stallings and Kaskowitz, 1974) have found such relationships and much of the impetus for the direct instruction movement rests on these findings (see Rosenshine, B.V. (1979) for a review of the direct instruction movement and its relationships to content and time). Although the relationship between student involvement and teacher supervision seems reasonably clear in mathematics and reading, little is known about either the direction or magnitude of the relationship in other subject areas. Indeed, it could be argued that since some subject areas are more amenable to small group work the relationship between engagement time and teacher supervision might be weaker. The research of Cornbleth and Korth (1979) in four subject areas seems to support this hypothesis. Contrary to their expectations, when observations were collapsed across four different subject areas, activity format was not found to be significantly related to pupil involved time. The considerable variation they discovered in format involvement scores suggests that other instructional features of an activity influence pupil involvement. It seems reasonable to expect that such an effect would be greater for self-paced, individual activities than for teacher-paced, group activities. Although the interaction between and among learning format, teacher behavior, and instructional materials seems clearly present, and the documentation of how teachers effectively utilize instructional material in differing format settings under different subject areas has real potential for improvement of instructional practice, little formal work has been undertaken to identify these relationships and to integrate the findings into some explanatory model.

A fourth set of variables, the organizational structure and norm pattern of the school, has a potentially important mediating effect on the time a teacher allocates for instruction in the various content areas, the effort the teacher expends on maintaining student involvement, and the extent of student self engagement. The work of Brookover (1973, 1975, 1977, 1979) has given rise to the belief that schools can and do make an important difference and that "climate" and organizational variables can account for a substantial portion of between school variance even after the removal of SES factors. However, no attempt has been made to explain how these variables ultimately impact student engagement and thus influence student achievement. One plausible explanation is that "climate" variables, organizational variables, and student achievement are partially linked through time factors, such as academic engagement time. For example, the staff's sense of academic futility (a climate variable identified by Brookover) or organizational structure (departmentalized, open, etc.) probably influences the amount of time individual teachers allocate for mathematics instruction. Similarily, students are also influenced by their peers via the school's social structure and norms, thus, the amount of time they self-engage in academic work depends to a large degree on what they preceive as their role expectations.

In addition to contextual and instructional variables, individual pupil differences are likely to affect involved time and represent the fifth area needing additional study. Pupils with high prior achievement are likely to be more motivated and less distracted than low prior achievement pupils and, consequently, might be expected to show greater involved time. Data consistent with these expectations are provided by several studies that found more involved time among high than low achievement pupils (Anderson, 1975; Arlin and Roth, 1978; Shimron, 1974; and Hall, Delquadri and Harris, 1977).

This lack of academic engagement time in low achievement students might stem from several sources, some of which have been discussed previously, i.e., individual student characteristics, school setting, school climate. Other sources could include the impact of individual teacher expectations for both academic achievement and student behavior. In addition to the much discussed "Pygmalion Effect," an equally plausible explanation for low active involvement time for low achievement students might rest in the teacher's need for control of classroom discipline. Clearly asking low achievers to participate in academic tasks involves serious risk for the teacher. To avoid the possibility of losing control and/or avoiding student failure (probably perceived by many teachers as a reflection of their ability) many teachers may simply avoid a potentially negative situation. (See Good, Ebmeier, and Beckerman, 1978 for a discussion of this phenomenon.)

The importance of increasing academic engagement time for all students and especially for low achievers can be seen through the research reported by Hall, Delquadri and Harris (1977). Working with low achieving inner city students who had initial low average academic involvement time, they instituted an intervention program consisting of only ten minutes per day of tutoring in oral reading, in learning word lists and in spelling. In-class academic performance as a result increased markedly. Similarly, when pupils practiced their multiplication facts for five minutes three times a week, lasting gains in performance were achieved.

The research previously cited clearly shows the importance of student academic engagement time. What seems less evident, however, are the mechanisms that can be used to increase academic involvement for various types of students. Although, hopefully, some instructional strategies may be productive for most students under given contexts, the aptitude-treatment-interaction literature (see Cronback and Snow, 1977 for a review) and our work (Ebmeier and Good, 1979) suggest that different strategies are probably needed for different types of students in different contexts. Clearly, instructional strategies that would ensure the academic involvement of a suburban, fourth grade, high- achieving girl would be different from those strategies designed for an inner city, low- achieving, fourth grade boy. Unfortunately, most of the existing studies employed largely middle class samples and, thus, were precluded from conclusions concerning the relationship between engagement rates and specific types of students.

If, indeed, engagement rates for different types of students are dependent on different teacher behaviors, activity formats and/or school settings, as research would indicate; and if those relationships can be documented, then the potential exists for dramatically increasing the teacher's effectiveness with students of all types of entering abilities. Importantly, two added benefits seemingly would occur. One, it would afford the teacher the opportunity to carefully structure the lesson to maximize involvement time for the majority of students. Second, since lack of classroom discipline is the most prevalent threat to learning and is generally caused by students not engaged in academic work, then any increase in classroom mean engagement rate would likely lower the incidence of behavioral disruptions.

The sixth area is the relationship among a teacher's characteristics, classroom behavior, and student academic engagement. Even though the process-product research has been quite successful in identifying the links between teacher behavior and student engagement time/achievement for average students, the relationships for students in the extremities of the ability distribution are not well documented. In addition, these studies have tended to ignore potential interactions between entering teacher characteristics (age, sex, experience, attitudes, predispositions, etc.) and the teacher's classroom instructional behavior. Our recent research (Ebmeier and Good, 1979) has illustrated the peril of ignoring teacher characteristics. For instance, although many teachers in our study engaged in relatively the same instructional behavior, different student achievement results were discovered. Although most models of teaching include a component called "entering teacher characteristics," most time on task research has overlooked this important factor.

Finally, the importance of grade level as a contextual influence cannot be underestimated. Because of the changes in student maturation level, academic content, teacher expertise, (upper grade teachers tend to be more subject specialized) as well as school expectations, the effectiveness of a given instructional technique or cluster of techniques is quite likely to change over the grade levels.

Hopefully, some instructional patterns will be reasonably effective in maintaining engagement across all subject areas and all grade levels. Conversely, other instructional patterns are likely to be subject and grade dependent. Therefore, it becomes incumbent upon the researcher to identify which instructional techniques are generic and which are situational. If found to be contextually bound then it is important to examine trends where present. For instance, at what point or grade level does the grouping practice seem to lose its effectiveness? Unfortunately, our knowledge of the many facets of time on task is largely restricted to a few grade levels in a few subject areas. To complete the puzzle more research is needed to find and place the missing pieces. If indeed the picture can be completed (or major portions thereof), then directional hypotheses can be developed and ultimately tested. This might lead to useful theories (e.g., as low achievers mature their engagement rates can be maintained by less alerting and monitoring teacher behavior) which could guide teachers in their preparation for and conduct of instructional lessons.

To summarize, although the relationship between pupil engaged time and achievement has been amply documented, many contextual and instructional factors influencing engaged time remain largely unexplored. These would include the single and multiple relationships between and among subject areas, time period, instructional format, school climate and expectations, individual pupil differences, teacher characteristics, grade level, academic achievement, and engagement rates.

Although a limited amount of data is available that addresses these problems and has been summarized in the preceding section, little substantive work has been undertaken to link and integrate these variables. For instance, although it is known that low prior achievers spend less time actively engaged in academic tasks, little is known about how teacher instructional behaviors or learning formats affect these engagement rates.

Similarily, although common knowledge dictates that students' learning styles change with maturity, we still do not know what contextual factors or instructional behaviors are likely to produce increased engagement rates at various grade levels, and, more importantly, how teachers can adjust their instructional patterns to accommodate evolving learning styles.

II. PURPOSE OF STUDY

The overall purpose of this research was threefold. First, to gather basic time on task descriptive data in all subject areas (grades 2-6) via approximately 500 full day observations throughout the school year. We felt this rich data base would afford us the opportunity to answer some of the basic research questions previously discussed and detailed in the following section. In addition, it would provide us, as well as external researchers, the opportunity to further mine the data after the initial study has been completed. Secondly, after the descriptive data was gathered and analyzed, we planned to integrate the findings into several theories which explained or predicted the observational data. Because of the magnitude and complexity of the data, we fully realized that this is a massive task; therefore, we chose to initially focus only on that portion of the data which yield the clearest and most consistent results. The third purpose of this research was essentially parochial; that is, our board of education, superintendent, director of elementary education, as well as our own department were interested in determining if the general findings from the extant time on task research studies applied in the Des Moines school district. If they did, then we hoped to use the results from this study to modify (where warranted) our instructional programs and monitor changes occurring from the modifications.

III. EXPERIMENTAL DESIGN

The time on task literature collectively suggests the existence of relationships between various contextual and instruction variables. These relationships can be conceptualized by the model presented in Figure 1.

Although space limitations prevent us from fully explaining the model, it is sufficient to say that we were interested in the relationships as indicated by the pointers, and planned to use the model to aid in our hypothesis formation and subsequent analysis.

Specifically then, this study was designed to answer the following questions:

1. To what extent do student engagement rates differ across

subject areas?

2. To what extent do student engagement rates differ across the days of the week and periods of the day?

3. To what extent does the instructional format affect student engagement rates, attitudes and achievement in math, language arts, science and social studies?

4. To what extent do school level expectations and climate affect student engagement rates, attitudes and achievement in math, language arts, and social studies?

5. To what extent does student prior achievement affect engagement rates?

6. To what extent do student engagement rates vary over the differing grade levels?

7. To what extent do the interactions among time periods, instructional format, school expectations, student prior achievement level, teacher instructional behavior and grade level affect student engagement rates, attitudes, and academic achievement in math, language arts, and social studies?

Sample Selection

The Des Moines school district, from which the sample was drawn, can best be typified as a medium sized urban school district. The district's average academic achievement as measured by scores on the Iowa Tests of Basic Skills has been near the 50th percentile for approximately ten years with schools normally distributed. Importantly, the district has developed and adopted a standardized elementary curriculum and textbook series; therefore, all elementary schools were striving toward mastery of common objectives, although through different instructional programs.

Because the study was done within and by the district, school participation was not dependent upon volunteers. This afforded us the opportunity of selecting schools that fulfilled two screening requirements: one, that the schools must have had a history of student population stability, achievement stability and teacher stability as documented by records dating back six years; and two, that the sample must include schools and teachers with varying degrees of effectiveness (as defined by residual achievement scores on a number of content area tests) and organizational patterns. All second through sixth grade teachers in the six to ten selected buildings and their students were included in the study. This constituted a sample of approximately 75 teachers and 1800 students evenly spread over five grade levels.

During the summer of 1980, the Department of Evaluation and Research made a careful study of the school district's elementary schools and eventually targeted eight buildings to participate in the study. The criteria used for selection were the percentage of students receiving free and reduced priced lunches, the percentage of minority students in attendance and the administrative instructional structure of the building; i.e., departmentalized, self-contained and I.G.E. The group of schools selected was considered very representative of the school district as a whole.

During the month of July the principals of the selected buildings met with staff members of the Department of Evaluation and Research to be briefed about their participation in this undertaking, and, in turn, were asked to participate in the selection of staff members and students in their buildings to be observed during the course of the year. Eventually two teachers for each of the grades (2 through 6) were selected at each building, totaling 80 teachers across the 8 buildings. Within each of the 80 classrooms 4 students were selected on the basis of their previous achievement, 1 above average student, 2 average students, and 1 below average student, or a total of 320 students across the five grade levels and eight elementary buildings.

Prior to the beginning of the school year, the principals were asked to inform the selected teachers that they would be observed during the course of the school year as well as being briefed about the intent and importance of the study. It was considered appropriate to permit the teacher to inform her students about the study if the occasion arose but none of the students actually observed knew who they were. This precaution was considered necessary to preclude any unusual behavior being elicited on behalf of the observed students. Several changes in teachers and students were necessitated due to local building scheduling changes; however, these changes were minor and accommodated prior to the commencement of observations. In all, six trained observers conducted a total of 454 full day classroom observations of 320 students involving 80 classroom teachers in grades two through six, at eight elementary buildings. A total of 1816 student days were observed. Actual classroom observations commenced on September 8, 1980, and were equally spaced throughout the 1980-81 academic year, finishing on June 3, 1981.

Instrumentation

1. The Direct Observation of Classroom Events (DOCE) system

The DOCE system was designed to provide an objective description of the instructional activities in elementary classrooms. Information about the instructional activities in classrooms was necessary in order to answer basic questions of interest to the school district: What amount and kind of instruction was provided to students during an instructional day? What kinds of instructional activities resulted in high and low student engagement rates? Were there particular instructional strategies that worked better for students of differing abilities? What was the relationship between the time of the day and student engagement rates? Were student engagement rates different in the different subject areas?

In order to answer the above questions, the DOCE system was designed to document the teacher's activities and activities of four of his/her students across all subject areas for the entire day. The DOCE system consists of two computer scorable sheets (DOCE Part I and DOCE Part II, see Appendix A) which were designed to be used by classroom observers to gather data in four areas: one, contextual information about the classroom, such as the number of students; two, high inference data about such general classroom qualities as the room temperature, degree of discipline problems, emphasis on individualization, amount of seatwork, etc; three, the sequence of teaching activities used to carry out lesson plans; and four, the engagement rates of selected students at specific intervals of time.

Upon entering a classroom the observer located him/herself unobtrusively but yet in such a fashion as to be able to observe the behavior of the preselected students. All the information appearing in Part I of the DOCE instrument was coded prior to the beginning of classroom activities with the exception of the High Inferences Measures. This information was not coded until the end of the school day, giving the observer enough time to observe all activities and whole class behaviors on behalf of the students, thus permitting a more informed judgment.

As soon as the school bell sounded and regular classroom activities commenced, the observer proceeded to Part II of the DOCE instrument and began recording teacher activities and student responses. The left half of Part II is devoted to monitoring the teacher's instructional/noninstructional behavior and activities while the right half of the form is ued to monitor each student's response. (The reader will note that under the student side there appear ten blocks of four columns each, one column for each of the four students observed.) Each Part II comprised 30 minutes of classroom observation time. As many Part II forms were completed as needed to fill out the total day of observation time. A new Part I was completed each time a class changed teachers (art, music, physical education) to maintain a complete record of all school activities.

To use the analogy of a motion picture and a snapshot, an observer monitored and recorded all teacher activities under the teacher column continuously for a three minute duration. At the end of this time segment, the observer immediately focused his/her attention on the four students and in essence took a "snapshot" of their behaviors at that moment in time. After coding the appropriate student behaviors, the observer refocused his/her attention back to the teacher (see the last six pages of the training manual in Appendix A for an example observation period). This process continued throughout the school day. As noted earlier each column within a block of four columns represented a single unique student. This pattern was maintained throughout the observational period. In addition to the subject areas in which the students were working, the observer coded whether learning was self-paced, i.e., the student was on his/her own, or other paced, i.e., directed by the classroom teacher, associate or an adult aide (this coding appears under the Structure section of DOCE Part II). The size of the group in which a student was working, either individually or in groups of two or more was also noted. This aspect of coding reflected the normal classroom structure of the teacher, either dealing with whole class instruction or dealing with students on a one-to-one basis.

2. Student Attitude Inventory

To gather student characteristics, dispositions, and attitudes toward various instructional practices and to serve as a mechanism by which different types of students can be identified for subsequent observation, a 53 item, self-report questionnaire was administered on a pre/post basis. This instrument is a modification of one used in previous studies (Ebmeier, 1978; Good,

1979) and has adequate reliabilities on most of its subscales as defined below: (See Appendix B for the actual instrument and Tables 1-9 for the reliability estimates)

1. Dependence/Independence - how much a student likes to structure his own work or assignments.

2. Behavior - the amount of trouble a student encounters.

3. Sense of Academic Futility - a student's belief in the uselessness of his effort.

4. Feedback - how much a student likes to hear about or check his own performance.

5. Other Expectation for Success - how much the student perceives others expecting him to do well.

6. Conscientiousness - about assignments.

7. Internal/External Motivation - a measure of the source of student motivation.

8. Student Self Concept - a measure of a student's belief in himself as a competent individual.

3. School Social Climate Index

Because we were interested in assessing the impact of school climate, norms, and expectations on student engagement rates, a questionnaire developed by Brookover (1978) and designed to gather climate data was administered to students of the targeted buildings. The instrument consists of five student subscales (Sense of Academic Futility, Future Evaluations and Expectations, Perceived Present Evaluations and Expectations, Perception of Teacher Push and Teacher Norms, and Academic Norms). The instrument's metric qualities are good (Brookover, 1979), and, importantly, the instrument has been reported to account for a significant portion of the between school differences in school achievement after SES has been removed, an important factor in this proposed study. (See Appendix C for the instrument and Tables 10-14 for reliability data on this sample)

4. Achievement and Aptitude Measures

The full Iowa Tests of Basic Skills Battery was administered in the fall (grades 4-6) and served as a measure of entering aptitude. Three content tests (mathematics, social studies, and language arts) which were constructed by a professional test writer and based on the district's instructional objectives served as the dependent measures. The internal reliability of each of these instruments is excellent (.90) as is their content validity.

IV. RESULTS AND DISCUSSION

Given the sheer magnitude of data and the difficulty of presenting the results in a clear, concise format, we decided to organize the discussion around several major themes and to present the results in segments or sections. The first few divisions focus on simple descriptive information such as the engagement rates across subject areas. In the middle section we turn our attention to the correlational results that were generated, and, in the last part we discuss some possible links among student characteristics, instructional formats, student attitudes, engagement rates and academic achievement.

Because of the magnitude and complexity of the data, the last section focuses on that portion of the data which yielded the clearest and most usable results. We hope in the future to further explore the data, and that the information collected from this project will serve as a rich source by which many addtional hypotheses can be tested by us and other investigators.

A. Descriptive Results

Basically, five sets of findings emerged from the data and can be clustered as follows: engagement rates across subject areas; engagement rates across the student ability dimension; engagement rates across task structure; and engagement rates over the school day. Tables 17-21 present the average engagement rates across subject areas and student prior achievement levels, while Figures 2-3 plot average engagement rates for the four student abillity levels as a function of the time of the school day.

Engagement Rates Across Subject Area

It is reasonably clear from examination of the Tables that the lowest engagement rates (particularly with low prior achievers) occur in subject matter areas which typically are allocated the most instructional time (reading, mathematics, and language arts). Interestingly, similar results were reported by Bennett (1981) and Cornbleth and Korth (1979), although the magnitude of the differences they report are much larger than found in this study. A possible implication of this finding is that further increasing allocated time in these basic skills areas might have a negligible effect on involved time. Indeed, it could be argued that there is not a linear relationship between time and learning, thus, simply adding more time by itself might not be productive past a certain point. One might argue, for instance, that it would be more productive to better utilize existing allocated time through different types and patterns of academic activities than to simply increase the allocated time in these basic skill areas. An experimental study that manipulated time allocations would be very helpful in untangling this dilemma.

Of all the subject areas, the highest engagement rates were reported in music and social studies and lowest in mathematics. Again, this data is consistent with the results of others (Bennett, 1981) and probably reflects the fact that music and social studies are two areas that generally are associated with more active student group involvement. In contrast, art, whose basic structure is also generally activity based, but on an individual basis, produced some of the lowest engagement rates in this study and in Good and Beckerman's (1978) investigation of engagement rates of sixth grade students. The difference seems to be in the format structure of the activity (i.e., group or individual) rather than the activity itself, although one must keep in mind that the engagement rate differences are not that large.

Although comparative data regarding average engagement rates across grade levels and subject areas is somewhat limited, our results seem to be consistent with the results of others. For instance, data from the BTES indicate that students in each of grades 2 and 5 were engaged in reading 74 percent of the time. In our study we found engagement rates of 82 and 84 percent respectively in the same subject areas and grade levels. Given that our observational data does not include beginning and end of period transitions (i.e., coded as occuring within a subject area) and that this accounts for about a 10 percent inflation of the engagement rates, the two sets of results are remarkably congruent. Similarly, Bennett (1981) in a study of British schools reported engagement rates of 95 percent in social and moral education in the second and fourth grades which correspond nicely to our findings of 90 and 88 percent respectively. In addition, Good and Beckerman's (1978) observation results across subject areas from the sixth grade are within 8 percentage points of those reported here although the ordering of engagement rates from most to least across subject areas is different.

Although there were some differences in engagement rates across subject areas, the magnitude of the difference was relatively low and suggests that the structure of the various disciplines and the way they are typically taught does not affect, in a major way, student engagement rates. (See Appendix D) What is apparently more important is the setting and/or classroom activities. That is, larger differences in student engagement rates are more likely to occur between group and individual instruction than between whole class instruction in science and whole class instruction in math (see Good and Beckerman, 1978).

Engagement Rates Across Student Abilities

The second portion of this study was to determine if student engagement rates across subject areas were different for students of differing achievement levels. As can be seen from examination of the data in Tables 17-21, the answer is mixed. Engagement rates in physical education and non-academic activities were reasonably stable across student achievement levels. In contrast, the higher a student's incoming aptitude level, the higher the engagement rates in the more academic areas (math, science, social studies, health, reading and language arts). At first glance these results may not appear striking. Indeed, others (Wang et al, 1982; Weisstein and Wang, 1978; and Hoffman, 1981) reported no significant differences in on-task rates for students of varying achievement levels and ages (sample size may be a problem in these studies). One explanation might be that although the engagement rates are reasonably similar (although statistically different) there is undoubtedly a qualitative difference between high and low achievers in terms of their engagement rates. For instance, as seen in the results of the Anderson and Scott (1974) study, students of higher verbal and quantitative aptitude are more consistent in their on-task engagement rates. Also, work by Resnick (1976) and others suggests that if students of different abilities are taught the same procedure for solving a problem, students with higher abilities tend to transform the procedure into a simpler, more efficient procedure, while students with lower abilities continue to employ the teacher prescribed method. Perhaps they translate and process the material in a more efficient manner than lower aptitude students.

Whatever the mechanics, these findings suggest that higher aptitude or ability students use their time differently from lower aptitude students. Tables 17-21 do, however, show that high achievers were coded as being engaged about 5-10 percent more frequently than low achievers. The day to day effect of this difference is likely to be considerable over time, especially since the biggest differences in engagement rates between high and low achievers occur in subjects that are traditionally considered basic skills (math, reading, language arts). Because low achievers are already behind other pupils, it would appear that their lower rates of work involvement would erode their opportunity to close the gap between their achievement and that of other pupils. Low achievers may have many problems--poor self-concept, low aptitude, lack of prerequisite skills and information. Whatever other problems low achievers may have, this study indicates that their general work habits appear to need improvement.

Engagement Rates Across Activity Format

Tables 22 through 26 describe the relative percent of time students spend in each type of activity format which were independent of the subject areas. For instance, listening could have occurred in reading, mathematics, social studies and so forth. We were interested in this descriptive data to try to determine exactly what percent of time students were spending in any given activity. As can be observed from Tables 22 through 26, the majority of time students are clearly spending listening and writing. From informal observation of classrooms most of this time apparently is devoted to listening to the teacher for instructions of various kinds and the writing is mostly attributed to filling out worksheets chiefly due to or derived from ditto masters or workbooks. A couple of items were interesting to us as we observed the Tables. One was the very low amount of time the students were actually spending engaged in reading. The actual reading percentages hovered between the six and seven percents upward to the upper eights in the sixth grade. One thing of importance that we did observe is that there wasn't any apparent difference in reading in terms of the percent of the time high and low achievers spend actively engaged. In fact, in some grades such as sixth, the low and below average achievers were actually spending a greater proportion of their time reading than the above average achievers. This is in slight contrast to the fourth and fifth grade where the higher achieving student seems to be spending slightly more time actively engaged in reading. Part of this may be attributed to the fact that high ability students, at least in the upper grades, apparently can master the material at a much quicker pace, and, therefore, if a teacher assigns a given story for the class to read the high achiever will be able to move through the material at a much quicker rate than the low achiever and the results could be attributable to this simple fact. (See Wang et al, 1982)

A couple of results surprised us in Tables 22 through 26. One was the relatively low amount of boardwork actually occurring in classrooms. We suspected much more, and, indeed, from our own recollection of our grade school experience felt that this occurred with a much greater frequency than it apparently does- at least in the schools that we were observing. Given that boardwork can be a very useful tool (especially in mathematics) for a teacher to check for student understanding, the dearth of such activities was surprising. In many ways this finding, as well as some of the incidental comments made by the observers from this and others' studies, support the findings of Leinhart (1981) who reported that surprisingly small amounts of time are spent in activities that are presumed to have high payoff for a variety of academic areas, and a great deal of time is spent on activities that have no clear instructional value. For instance, we found that transition in all grade levels across all student prior ability levels was relatively high. This confirms what others have found--that transition occupies a large part of the student's school experience. In fact, if one studies Tables 22 through 26, one will notice that students were actually spending more time in transition than they were in speaking and reading combined.

Another interesting finding from our data is that most of the work occurring in elementary schools is apparently very tightly connected to their listening to the teacher, physically writing or completing worksheets, or working on problems. Part of this is probably necessitated by the reading group function. That is, because an elementary teacher has several reading groups, as she/he is spending time with one reading group the others must be engaged in some kind of activity, worksheets and so forth. Worksheets could be perceived by the teacher as not only beneficial but allowing them to proceed relatively smoothly with the reading groups at hand. However, given that a great deal of time is spent completing worksheets, it seems important that these materials exhibit all the qualities of good instructional devices (instructive, corrective feedback, motivation, appropriate practice, etc.). Unfortunately, many times these worksheets are of limited quality and chiefly designed as practice exercises. We suspect that given the nature of the material and the huge amounts of time students devote to these activities, that a good deal of that engaged time may be of little value in terms of student learning (but not necessarily from the teacher's viewpoint of class management). The use of programmed instruction, computer assisted instruction, self scoring worksheets, or such similar devices in these instances would seem like a much better practice if, indeed, this kind of seatwork activity is necessary. Unfortunately, high quality material of this nature is generally not available.

Tables 27 through 31 present the student engagement rates across instructional activity format or expectation. That is, in the coding system we asked the coders to record what the students were expected to be doing and then indicate at the same time whether they were engaged in the activities which the teacher expected to be occurring. In general, the physical activities where students had to participate on a physical level, had engagement rates that were relatively high. We did notice, however, that in those activities where students are expected to be doing something by themselves such as writing or reading, the actual engagement rates fall off quite a bit. That is, the engagement rates at sixth grade are likely to be less than they are in fifth grade, fourth grade and so forth. Again, the two lowest areas were writing and reading.

Group activities, on the other hand, resulted in relatively high engagement rates. This was a surprise as we expected activities that required students to be in groups to result in low engagement rates. The rationale here would be that in a group of five or six, a couple of students would be carrying the ball while other students would be inactively watching or having the opportunity to misbehave. Contrary to the predicted results, engagement rates for students in all ability groups were higher in group setting. Wang, et al (1982) reported a similar surprise when they found a significant positive relationship between working in group settings and students' on-task behavior. They went on to report that working in individual settings showed a significant positive correlation with distracted behavior, but it showed a significant negative correlation with on-task behavior. Further, their data suggested that students were less likely to be distracted when they worked in group interactive settings and that they tended to work on exploratory tasks of their own choosing in such settings. Wang cautions, however, that although students tended to show a higher rate of time-on-task when working in group interactive settings, management interactions between teachers and students occurred more often in such settings, particularly when students worked on exploratory tasks.

Wang's and our study's results are remarkably similar although the coding systems varied. Most of the group work in our study occurred in social studies or music which tend to be more ameneable to group projects and/or discussions. Given that social studies and music were two subject areas that recorded the highest engagement rates, one could easily attribute this to the instructional format (group settings). This does, however, present an interesting dilemma in that one cannot be sure from the available data whether the subject matter or instructional format is directly linked to engagement rates. If the two are interactive, then perscriptive advice about the occurrence and duration of group work may be subject (or task) specific.

In assessing the comparability of these results with the recent effective schooling literature, both similar and contrasting patterns are noted. Cases-in-point are the inferences in the literature which suggest that students' on-task behavior is significantly related to working in group settings (e.g., Bennett, 1976; Fisher, Marliave, and Filby, 1979; Rosenshine, 1980). Upon closer examination of the data from Wang's and our study, a more complicated pattern emerges. While positively related to working in group settings, on-task behavior was found to be negatively related to prescriptive tasks (tasks prescribed and assigned by teachers on the basis of diagnostic test results or more academic assigned tasks). Findings in the literature tend to show, however, that working on appropriate teacher-prescribed tasks generally is related positively to on-task behavior. Interpretation of the two studies' findings of the intercorrelations of on-task behavior with the settings in which students spent their learning time and the types of learning in which they engaged is complicated further by the data which suggest that working on prescriptive tasks is associated with working in individual settings (e.g., math seatwork) as well as by the data which suggest that individual settings and prescriptive tasks both are negatively correlated with on-task behavior. These confounded findings suggest the situation- specific nature of rates of time-on-task and the need to further delineate the specific relationship between time-on-task and the types of learning tasks on which students work as well as the types of settings in which students work. Such information can result in a better understanding of the interrelationship among time-on-task, the specific nature of the task, and the conditions under which students work. The outcome of this work might be of assistance to Slavin and others who are working extensively in group processes to involve low achievers and to try to ameliorate some of their academic problems by peer tutoring and similar techniques. The data from our study indicates that this may be a relatively effective technique given that when students were engaged in group activities engagement rates were relatively high.

As a precautionary note one must remember, however, that engagement rates as determined from the above analysis were collapsed over all subject areas and that, therefore, there may be some important findings missing or submerged in the results. For instance, group activities more frequently occurred in music, physical education and social studies than they did in reading, math and science. If the reader will recall we discovered from previous study that the engagement rate in the basic core academic subjects is significantly lower than in subjects that involve high activity formats. Therefore, one possible explanation of the higher engagement rates in group activities, as discussed above, is simply that group activities more frequently occur in non-core academic classes. Therefore, just because students had higher engagement rates in group work in general, it may not follow that higher engagement rates could be produced in the academic subject areas such as math, reading, language arts and science simply by forming teams or groups. If, indeed, we could raise engagement rates by some such arrangement it would be important to know, however, the data that we have currently analyzed does not shed any particular light upon this apparently critical question. The question of whether forming groups and increasing the number of group activities can actually increase engagement rates in the academic content areas is one of the questions that has evolved from this initial investigation and certainly should be pursued. In the future we hope to address this problem via secondary analysis of the existing collected data.

To shed further light on the group engagement rate dilemma we asked the coders to make some determination as to the number of students in the group with the targeted student when they were coding engagement rates. We believed that the larger the group size the more likely it was that the teacher would be with that particular group. This hypothesis was later confirmed by analysis of another category on the coding sheet which indicated whether the teacher was with that group or not. In the larger groups the teacher was generally with the group, however, in the smaller groups the teacher was not as likely to be present. It only makes sense that as the number of groups increases the group size decreases and obviously the teachers cannot spend a significant portion of their time with any one group. We thought that as the group size increased the teacher would more likely be spending time with that group and, therefore, the accountability function would be a little higher because the teacher was physically present, and engagement rates would be comparably higher.

In analysis of Table 32, indeed, that is exactly what we found. As the group size increased where we had four or more people in a particular group (which generally meant full class instruction) the engagement rates were much higher across all ability dimensions than they were when people were working clearly by themselves. In terms of individualized instruction versus group instruction we believe this finding has major significance in the sense that it indicates that when students are in individualized settings their engagement rates are likely to be lower than they would be if the teacher was actively monitoring the situation. Secondly, we observed that most of classroom instruction occurs in two grouping formats. One is that where four or more people are involved, generally this means whole class instruction while the other kind of arrangement is generally where one person is working by him or herself. The frequency of the number of times that the coders coded two or three people in a group was very limited. Given the massive amount of data that was coded, the very infrequent recording of two or three person groups in any subject area was somewhat of a surprise to us and clearly indicates to us that not much individual teaming or peer tutoring is currently occurring, at least in the classrooms that were monitored. Interestingly, some researchers (Slavin, 1983) have argued strongly that peer tutoring on a one to one basis where a brighter child would be tutoring a slower child is a very effective technique in helping especially the low achiever. Our data, however, indicates that very little of this is currently occurring in a naturalistic setting in elementary classrooms. If, indeed, Slavin's work is correct and that of Peterson (1981), then, apparently teachers are missing an excellent opportunity to use a technique that has apparent utility in helping both the low and high achievers. (For further discussion of this peer tutoring potential see Good, Grouws and Ebmeier, 1983.

Engagement Rates as a Function of Time of Day

Finally, as is evidenced by Figures 2 and 3, engagement rates across the day of low and high prior achievers do fluctuate and there appears to be some predictability in the percent of students who are actively engaged at any given time. In general, students appear to be on task at the beginning of the day but then their engagement rate drops precipitously during the next hour. Given that the beginning of the school day is usually filled with structuring and orientation activities that are typically teacher directed, this relatively high engagement seems predictable. In contrast, after the first 10-15 minutes of the day, students are frequently assigned seatwork or other types of academic tasks which, as others have pointed out, tends to result in lower engagement rates and probably results in the decline in engagement rates as is evident from examination of Figures 2 and 3. The exception to this scenario was the low prior achievers in the second grade whose engagement rates were relatively stable over this period of the day. The reason for this exception cannot be determined from the data we gathered but it seems potentially important. It would be interesting to interview some low achieving students in the first, second, and third grades to gather their perceptions about the beginning of the instructional day.

During the mid-morning until about noon the average engagement rates are cyclical, going through two down-up-down phases. Interestingly, these cycles occur at approximately the same time for both high and low achievers and probably are related to the cyclic nature of the instructional activities occurring throughout the morning. Although empirical data addressing this point is currently absent, it would seem reasonable that the peaks are associated with more teacher controlled activity and the valleys associated with more seatwork or student independent practice. In this scenario three major instructional activities typically occur in the morning.

Outside the general decline in engagement rates of low and high prior achievers toward the end of the day, attention rates in the afternoon remained relatively stable (with the exception of low achievers in second grade) and in general were as high as in the morning. This might in part be due to teachers intentionally placing high interest activities in the afternoon and teaching the more academic subjects earlier in the day or, indeed, student's attention spans may be reasonably long, and therefore they are capable of sustained academic involvement during the entire day. Clearly, this finding needs further clarification.

B. Correlational Results

To determine what global high inference variables were related to engagement rates of four types of students, the observers recorded at the end of the day (or class period if students changed teachers) their ratings of the teacher in each applicable category. These ratings were then correlated with the average engagement rate of each of the four student types. One must remember in examining the tables that the correlations are based on a collapsing of all subject areas and task structure. As others have pointed out, (Carroll, 1963; Anderson; 1980; Peterson, 1979) the types of instruction that are associated with high levels of time-on-task may differ according to the type of learning task being pursued (e.g., (1) tasks involving the learning of facts and generalizations; (2) tasks involving the development of an understanding of concepts; and (3) tasks involving the acquisition of skills) and, therefore, one must be cautious in making any specific inferences from the data. Note that this does not diminish the value of this analysis, rather, one simply must remember that different types of learning tasks may require rather different types of instruction if high levels of time-on-task are to be exhibited by the students.

The individual correlations appear in Tables 39-44 and a summary of the significant correlations ($p < .05$) appears in Table 33. In general, the correlations fell into four categories: one, those correlations between engagement rates and a high inference variable that were significant across most grade levels and student types; second, those correlations between engagement rates and a high inference variable that were significant at some grade levels but not others; third, those correlations between engagement rates and a high inference variable that were significant at some student achievement levels but not others; and four, those correlations that were not consistent and/or significant across any grade level or student type.

The high inference variables that did not seem to be important in keeping students engaged were: class size, emphasis on warmth/affect, amount of flexibility, degree of student self-initiation, amount of assigned homework, amount of controlled practice, amount of wall displays, and room temperature. With the exception of the finding that controlled practice had little relationship to engagement rates, the rest of the results were reasonably predictable. For instance, the assigning of homework, unless done in class, would not logically lead to higher engagement rates. Indeed, if the teacher allowed seatwork practice to be done at a later time and termed it homework, engagement rates might be substantially reduced since the student knew he need not hurry since he could finish it later at home and with possible assistance from a parent or sibling.

Those variables that were generally associated with higher engagement rates regardless of the grade level or student achievement level were: amount of teacher directiveness, amount of discipline problems (negatively), task emphasis, clarity of presentations, smoothness of shifts between activities, amount of student cooperation, degree to which class was kept on task, amount of student movement (negatively), and noise level (negatively). Not surprisingly, most of these same positive correlations have previously been reported as also having significant correlations with achievement. These findings would clearly indicate that controlled, orderly, teacher-centered, task-oriented classrooms are more often associated with high student engagement rates than more student-centered and individualized environments. These results would also lend strong support to the direct instruction model which advocates active teaching within a structured setting.

Although there were some high inference variables that were significantly correlated with student engagement rates and some that apparently had little consistent relationship to engagement rates at any grade level, there were a few coded variables whose relationship with student engagement rates were dependent on the grade level. For example, the relationship between student time on task and the variable called "amount of student choice" was consistently significant (negatively) only at the sixth grade level. At the lower grade levels the choice patterns afforded by the teacher were not related to engagement rates. Similarly, the "degree to which students were held responsible" was more important in keeping students on task at the 4-6 grade levels than at lower levels. In contrast, "monitoring of seatwork" was negatively related to engagement at the second grade level but not at grade levels 3-6. These progressive changes in variable relationships over the grade levels can be attributed at least in part to student maturation differences and in part to the academic expectations at the different grade levels. Given that the maturity level of 4-6 grade students allows for the assignment of more extended projects (e.g., seatwork) which are not possible at the lower levels, and that this constitutes a major portion of the instructional day, the results are not surprising. We would suspect that if second grade children were mature enough to handle independent seatwork and if it was typically assigned, then, the "holding students responsible" would be important. In essence, what we are suggesting is that many of the grade level findings may be more attributable to different activity structures across grade levels than to appropriate teacher practice.

Finally, there were three high inference variables that seemed to be differentially important for high and low achievers. First, high prior achievers stayed on task more frequently than low prior achievers if the class was racially mixed. That is, the number of minority students in the classroom was positively correlated to task engagement of high achievers in four of five grade levels but only related at two of the five grade levels for low achievers. Interestingly, there was only one negative correlation discovered which indicates that racial integration has little effect on on-task behavior of students. Secondly, the amount of process evaluation was apparently more important for lower achievers than above average prior achievers. Understandably, given that low achievers typically have difficulty understanding the lesson, extra teacher attention in explaining how to work a problem or overcome a difficulty is important. Process feedback may not be as important for high students simply because the teacher probably will reteach a lesson if it is apparent that the better students are having difficulty understanding. Thus, it is unlikely that high achievers will be asked to begin seatwork until they basically understand the material. Interestingly, as the material becomes more difficult at the upper grades, process feedback is also important for high achievers.

The last variable that was differentially related to low and high on-task behavior was the degree of individualization. Although the difference was not large, low achievers' engagement rates were more often related negatively to the degree of individualization than high achievers' engagement rates. The implication here is that techniques usually used to individualize instruction, such as grouping, are associated with lower engagement rates and thus may not be as advisable for low achievers as is commonly believed by practitioners.

C. Protocol Analysis

Although the correlational results were revealing and shed some light on the importance of the high inference variables across student ability levels, we thought we might obtain more insightful information by looking at the more molecular information found in individual observations. Rather than attempting to isolate crucial constructs useful at all grade levels, which would be an overwhelming task, we thought it more productive to focus on one grade level (fourth grade). To further limit the scope of this particular endeavor we chose only to study in detail the observational records of 40 teaching episodes--20 from teachers who had high engagement rates for high but not low achievers, and 29 from teachers who had low engagement rates for high but not low achievement students. Clearly, this means that the results as discussed below should be reviewed as tentative but still worthwhile pursuing in more detail. It is also important to point out that most protocols examined were either generally productive in keeping all students on task or the reverse. That is, most teachers seemed to either be generally effective for all four types of students or generally ineffective--it was difficult finding teachers who were differentially effective.

Given these caveats, our major findings can be divided into two divisions: techniques or sequences found effective for low achievers and those found effective for high achievers. In terms of low prior achievers we found three major constructs useful in explaining the differential effectiveness of various instructional techniques. The first concept was insulation, defined as the ability to shield students from interruption. We found that teachers who were good insulators maintained high engagement rates of low achievers but that the insulation factor was less important for high prior achievers, as apparently they have better internal shielding mechanisms than low achievers. Insulation factors that were important consisted of such things as reducing either teacher or student interruptions, especially during seatwork, following a systematic, predictable sequence of learning activities (e.g., using the same teaching cycle over different subject areas and days), and controlling behavioral problems. The second concept that was important in working with low achievers was continuity/predictability. Those teachers who made clean and swift transitions between activities and/or lessons had more on-task behavior. This on-task behavior was increased further if low achievers knew what behavior was expected and knew they were going to have to demonstrate or use what they were learning at a later date (e.g., holding students accountable). The last concept, called momentum, was very critical to on-task behavior. Teachers who allocated and spent large blocks of time in any one activity had low engagement rates for low prior achievers. For example, spending 45 minutes in lesson development or seatwork (especially unsupervised) was disastrous in terms of low achievers' engagement rates. Teachers who made several passes at a given subject area per day had better involvement rates unless the lessons occurred too frequently which, naturally, produced the opposite effect.

High achievers on the other hand seemed to profit more from differentiated activities than low achievers. That is, if the teacher let them work on a number of different activities within the subject area rather than only on a common task, their engagement rates were higher. Low achievers, on the other hand, did not profit from differentiated activities. Secondly, although insulation, continuity and momentum were all important to keep high achievers on task, they were not as critical as to low prior achievers. As previously suggested, the reduced importance of these factors may be due to high achievers' ability to be more self-regulated. Thus, it is probably not that these variables are unimportant, but rather, that the source of control is more internalized with high achievers. The final factor we thought was important in keeping high prior achievers on task was what we termed clear academic expectations. By this we mean that teachers who expected high achievers to always be working on some academic task and provided enrichment activities when they were finished with the regular lesson had higher engagement rates. In contrast, in classrooms where high achievers' engagement rates were lower, teachers did not provide this material and many times these students would not be appropriately on-task after they finished their seatwork.

In summary, we have presented some descriptive and correlational data concerning engagement rates of elementary school students across grade levels, instructional formats, and teaching behavior and activities. Unfortunately, there is little normative information that can be used to interpret the data presented here. What is a reasonable expectation for involvement? Should pupils be involved 80 percent of the time? Perhaps it is reasonable to expect high involvement only some of the time followed by relaxation opportunities. Research is needed to build on the descriptive base of this study. If the involvement of low achievers is increased, do their attitudes and achievements improve? Do improvements in the attending behavior of low achievers come at the expense of other pupils? And importantly, what instructional activities and settings can be manipulated to increase engagement rates of low and high prior achieving students?

D. Inferrential Results

In the previous sections we discussed our descriptive and correlational findings and the possible implications these results might have on classroom practice and on future research. In this section we will turn our attention to the inferential work that evolved from this study, specifically focusing on model building within the time on task framework. Before turning our attention directly to the empirical results from this study, however, we will first establish a framework by discussing the models of school learning proposed by Bloom, Harnischfeger and Wiley and Carroll (see Harnischfeger and Wiley, 1978 for a more comprehensive discussion).

Our interest in describing these models first and then discussing our results stems from our belief in the importance of model building in educational research. For too long research in the field of education has focused on isolated and over-simplified factors that many times lack clear relationships among each other and, importantly, with practice. The investigation of the natural classroom situation in ways which reflect the integration of pupil, teacher, and curriculum has only rarely been attempted (e.g., Gump, 1967; Kounin, 1970; Smith and Geoffrey, 1968). This has impoverished both research and practice and generally been responsible for the indiference or ambivilence shown by practitioners toward research findings. Theory-based models with postulates or models that integrate pupil and teacher activities in meaningful ways which take account of the complex interactions among content, entering characteristics or behavior and the teaching-learning process are difficult to find. In contrast, in the physical sciences almost all effort is directed at finding relationships between components and then interlinking the components with the purpose of developing theories that can predict or explain natural phenomenon. In our opinion, this orientation has resulted in the rapid technological development seen during the last 50 years. In contrast, many of the variables currently under investigation by educational research have been studied for over 50 years yet no explanatory theory has yet emerged. Although we realize that the behavior of humans is infinitely more complex than that of alpha particles, it is only logical to believe that after 50 years of research we could offer at least some preliminary theories. About the best we can offer for evidence of success, however, is a few general principles chiefly derived from educational psychology. (see Dunkin and Biddle, 1974 for a review)

Fortunately, within the last few years three models which begin to grasp these integral parts of schooling and which are usable in empirical work on classroom learning have been published. Two of these models, those of Bloom, and Harnischfeger and Wiley are more recent, while the third, Carroll's, has been in existence for over 20 years and has only recently received renewed interest.

Carroll was the first to develop a model of school learning in which time played the major role. In his model, achievement is a function of the actual time needed for learning and the time actually spent in learning. An important feature of this model is that these time variables are both defined in terms of the learner's active learning (i.e., not elapsed or potential time) rather than that part of such time which has actually elapsed. These two determinants, however, are themselves influenced by several other factors. For instance, the time needed for learning is dependent upon the individual's understanding of the task requirements which, in turn, are dependent on the quality of instruction (clarity of communication, task presentation, subtask sequencing, pacing, individualization, etc.) and the ability to understand instruction which is, in turn, dependent on general intelligence. In a similar fashion, time spent in learning is influenced by perseverance which is also influenced by quality of instruction. The core idea in Carroll's model is the expression of aptitude, opportunity, and perseverance in time metric. An individual's aptitude for a specific task is defined in terms of the time an individual needs to learn the task under optimal conditions. Thus, time needed is solely a function of a learner's basic aptitudes and prior learnings; and this time will vary according to his ability to understand instruction in conjunction with the quality of instruction he receives.

Bloom's model of school learning specifies that learning outcomes are a function of four dimensions: pupils' cognitive entry behaviors and affective entry characteristics; learning tasks, and quality of instruction. Learning outcomes are specified as level and type of achievement, rate of learning, and affective outcomes. Cognitive entry behaviors are defined as the knowledge, skills, and competencies necessary to learn a specified task. They are, however, not general aptitudes but rather specific prerequisites for the defined learning task, but also, more generally, academic self-concept, attitudes toward school and learning.

To Bloom the quality of instruction is dependent on cues, participation, reinforcement and feedback/correctives. Cues designate all information concerning the presentation and explanation of the task. Participation involves active pupil effort in learning a task which Bloom sometimes calls involvement or engagement. It is important to note that Bloom's model differs from Carroll's in that Bloom notes that participation or active learning can be either covert or overt. Reinforcement is the term assigned to affective reactions to pupil behaviors such as praise, blame, supporting or discouraging statements. Feedback/correctives apparently denotes a type of use of cues and reinforcement. Feedback and correctives are employed to provide additional cues and reinforcement after initial instruction and to encourage and direct additional participation.

Bloom specifies three types of learning outcomes: level and type of achievement, rate of learning, and affective outcomes. Achievement is typically determined by criterion-referenced tests. Rate of learning is primarily used to refer to the amount of learning that occurred during a given time period rather than during a unit of active learning time or time-on-task. Thus, as indicated above, increases in the percentage of active learning time or engagement rate, as well as increases in the effectiveness of such time, could contribute to improved learning rates when they are defined in terms of elapsed time. In this manner Bloom and Carroll's models can be linked.

Harnischfeger and Wiley's model of the teaching-learning process draws heavily on Carroll but is also influenced by Bloom. The basic assumption of the model is that a pupil's learning activities are central to his learning. Pupil activities are specified as causally intermediate between the teacher's implementation of the curriculum and the pupil's acquisitions, and are therefore the focus of the model's conception of the education process. The macro model is composed of three segments; background, teaching-learning process, and acquisition. Background factors include those relating to teachers as well as pupils, such as social and home background, age, sex, teacher preparation and education, pupils' prior achievements, motivation and other aptitudes. They consist also of state, community, district, and school characteristics. The teaching-learning process category includes the teachers' and pupils' activities and pursuits which are the major focus of the model. Activities of the teacher are causally relevant only in the way they influence pupil pursuits and through them pupil achievement. Teacher activities are, in turn, influenced by all three kinds of background factors. The acquisition category represents the outcomes of learning. The model currently (as of 1978) only considers pupil achievement as an outgrowth of pupil pursuits and pupil background factors.

Commonality of Models

As is readily apparent, the models differ both in emphasis and assertion. Carroll focuses on the distinctive role which various cognitive abilities play in school learning, discriminating the task-specific from the general and carefully articulating their relations to quality of instruction. Bloom focuses on the sequential character of many classroom learning experiences and turns them into an emphasis on task preconditions. Harnischfeger and Wiley refine the nature of class learning opportunities and their powerful influences on both the content and degree of educational achievement.

The three models, although different in focus, tackle issues centrally important in educational research, practice, and policy. They provide a means to overcome non-integrative views of the teaching and learning process and their level of specification allows them to be used in empirical research. Although the models lack congruency in every aspect, the general consensus is simply stated: pupils' experiences, adequately supported by the amount of time spent actively learning, and pupils' characteristics, including their cognitive capabilities, are the sole proximal and distinctive determinants of achievement. Instruction influences active learning directly via the allocation and use of instructional time and indirectly via pupil motivation. A simple model of these consensus relationships appears in Figure 4.

Focus of Our Inferential Work

Given that some conceptual overlap in teaching-learning models aparently exists as illustrated by Figure 4, we thought it would be profitable to begin our exploratory work there. In addition, although we did find significant correlation between engagement rates and achievement in language arts, mathematics, and social studies (see Table 45) we chose to focus our investigation on mathematics as we felt that subject to be most closely linked to formal schooling and thus less subject to external influences.(1)

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(1) Before focusing exclusively on mathematics the reader might want to examine Table 46 which displays the correlations between the student attitude dimensions and engagement rates and residualized achievement scores. Clearly, these are different patterns that emerge and indicate that engagement rates are differentially linked to student affective variables. Part of these differences is probably a reaction to the tasks inherent in the various disciplines.

The left side of Figure 4 indicates those variables that we found to be correlated with time on task that were discussed previously in the correlational section of this paper. In general, across all grade levels and all achievement categories several variables clearly were evident as important to the engagement rate of students and which we have termed as being a component of instructional effectiveness. The amount of teacher directiveness was clearly related to engagement rates especially in the upper grade levels and across all the ability dimensions. The more directive a teacher was, the more time students spent directly involved in learning tasks. The second area that correlated highly was the amount of discipline problems. Obviously a class with a high level of disruption is not likely to be on task as much. This variable was significant at the point .001 level at all grade levels across all ability dimensions. Apparently it is a critical element in effective instruction, although some would classify it as a management technique. The third variable that was important was the emphasis on task completion. Those teachers who spent a lot of time emphasizing the completion of homework, completion of seatwork, getting things done, keeping their activities focused on academic work, resulted in a higher engagement rate. Again, this was relatively prevelant across grade levels and ability dimensions. The Clarity of a teacher's presentation was another variable we found highly correlated with engagement rates and seems again to be a key element in the quality of instruction dimension we have illustrated in Figure 4.

Smoothness of shifts was another area that we found to be correlated with time on task across all ability dimensions and grade levels. The ease with which a teacher moved from one particular activity to the other without encountering too many disruptions was very important to keeping the students on task. The degree to which students were held responsible was also important (probably more at the upper grade levels than at the lower grade levels) and seemed to be an important dimension of the quantity we termed instructional effectiveness. Cooperation of students in work assignments and routine tasks again was another variable that was important in the instructional effectiveness dimension, as was the amount of student movement which was negatively correlated to the time on task. That is, the more movement that occurred within a classroom, the less time students would spend actively engaged. This was obvious in the sense that when students are up moving around either through transition or for some other reason (i.e., sharpening pencils, getting out material) clearly they can't be engaged in academic work. Direct teacher presentation was another important dimension of instructional effectiveness, especially at the upper grade levels and especially for higher achieving students. Classes who had an academic focus clearly were moving toward pre-determined teacher goals and seemed to have higher engagement rates. The last variable that we found important in terms of quality of instruction was noise level; the higher the noise level, the less task engagement rate. We found this particularly true in open space schools in our observational sample. Those schools that had reasonably high noise levels had great difficulty keeping students on task.

The above list is by no means comprehensive and we would not suggest that these are the only critical variables of instructional effectiveness. Obviously they are only a sampling, but they do have great impact on the degree to which students are kept on task, and we felt this was a beginning of a delineation of factors that seemingly are important for keeping students actively engaged. In many ways this work parallels that of Rosenshine and others who have been focusing on those high inference variables that are directly related to academic achievement. Interestingly, the same variables we were finding relating directly to keeping students actively engaged others have reported as being very relevant to academic achievement in general.

On the right side of Figure 4 toward the top there is a dimension called Aptitude. This, in essence, was the mathematic subscale of the Iowa Test of Basic Skills. We felt that aptitude was truly important for academic achievement as has been clearly demonstrated by numerous studies but was also important for attitude formation. Therefore, we put aptitude at the top of the model thinking that the aptitude dimension did not directly relate to student achievement but worked through several other variables. One of the variables we labeled Attitude Factors. This factor consists of a host of pre-dispositions that students have when they enter the classroom. Some of these factors have been termed by others ability to understand instruction, understanding of task requirements, academic self-concept, attitudes toward school, subject related effective characteristics, sense of futility, etc. To derive or add meaning to this factor we first examined the inner correlations between the scales on our student attitude inventory and Brookover's Instrument and tried to derive a general variable that would represent this pre-disposition toward academic work and engagement. The resulting variable we have termed attitude and it really is a composition of several of the scales which would include the student self-concept from our Attitude Inventory and the following three scales from Brookover's Instrument: Academic Futility scale, Future Evaluation and Expectation scale, and Present Evaluation and Expectation scale. The second dimension which is fed by the Attitude concept we have termed persistance. Again, this follows very closely the models of Harnischfeger and Wiley, Bloom and Carroll in the sense it represents a concept that is common to all models and refers to students' ability to keep themselves engaged with little external motivation. This scale is composed of two dimensions from our attitude inventory - conscientiousness and internal motivation. Although these scales do not have particularly high internal reliabilities separately, as can be seen from Table 48, the internal reliability of the two scales combined is reasonably good though not as high as we would have liked on this particular critical dimension. To give the reader a flavor of this model, we believed initially that the entering aptitude was likely to be very influential on the student's pre-disposition toward school work and toward engagement rates, and that entering attitude in turn would be very influential in terms of engagement rates, which, in turn, would be a key determinate of the amount of information the student was actually learning as reflected by the mathematics post test scores.

All other constructs suggested by Carroll, Bloom and Harnischfeger and Wiley are, for the most part, mediated through these core variables. Of particular interest among the core variables is student aptitude. This particular construct serves as an "initiator" or as a starting point upon which all other variable relationships are based. We do not want to engage in a discussion of the nature/nurture question here and only suggest that by the second grade aptitude plays an important role in attitude development. More specifically, it is assumed that a student's aptitude is positively related to achievement, engagement rate, student persistence and attitude (i.e., high aptitude implies higher achievement, higher engagement rates, higher motivation and better attitudes toward school, while lower aptitude suggests the opposite effect).

Results of Inferential Work

In terms of the proposed core model (see Figure 4) aptitude serves as the initiator and, as the model suggests, is filtered through entering disposition, student persistence and mean engagement rate, successively. From an intuitive standpoint, this suggests that aptitude should have the highest correlation with student entering disposition and successively lower correlations with each independent variable in the model (note, math achievement is the dependent variable in the model) up to mean engagement rate as the effects of aptitude get "filtered" out. This filtering process can be observed empirically by referring to Table 49 of zero and part correlations. The zero order correlation of aptitude with disposition is .49, with persistence .36, and finally with engagement rate .31. The correlation between student aptitude and achievement (.67) is typical of the relationships between aptitude and achievement measures.

The simple regression of student achievement (dependent variable) on mean engagement rate, persistence, disposition and aptitude (refer to Table 48) reveals the highly significant contribution aptitude has in explaining student achievement. In spite of aptitude's high explanatory contribution, both student engagement rate and entering disposition are contributing to the explanation of variability associated with student achievement. The fact that the persistence measure is not significant is principally due to its high correlation (see Table 47) with the student disposition measure, suggesting that both constructs are measuring a uniting trait.

In order to arrive at a better understanding of how the independent variables are contributing to the explanation of student achievement, apart from the influence of aptitude (primarily due to the high correlations existing between aptitude and the other three independent variables as noted previously), the following strategy was employed. Each of the three independent variables along with student achievement were regressed individually on student aptitude. Each regression equation produced a set of residuals, that is, what remained after the effects of aptitude were removed. The residualized independent variables were then regressed into residualized achievement in order to investigate the explanatory power of the equation adjusted for aptitude. The results can be considered in two forms. Table 49 presents the regression analysis results, while Table 47 presents the results of the part correlations. Surprisingly, a similar degree of explanatory power results from this procedure when compared to the full model regression presented in Table 48. Both engagement rate and entering disposition are contributing to the explanation of student achievement adjustd for aptitude, while student persistence is negligible.(2) This is due once again to the relatively high part correlation between entering attitude and persistence (see Table 47) suggesting both variables are measuring

(2) Even though the significance of the coefficient for entering attitude is not statistically significant at the conventionally adopted .05 level, we consider .08 strong enough to warrant consideration of this variable within the model.

the same construct. Consequently, it is clear from this more stringent test that engagement rate and student attitude, both adjusted for aptitude, play a significant role in explaining student achievement, with engagement rate being the more significant of the two. Likewise, on the basis of the empirical results, the hypothesized model with aptitude serving as an "initiator" variable with its effect being filtered throughout the remaining variable appears tenable as a "core" model upon which further expanded models can be built and investigated.

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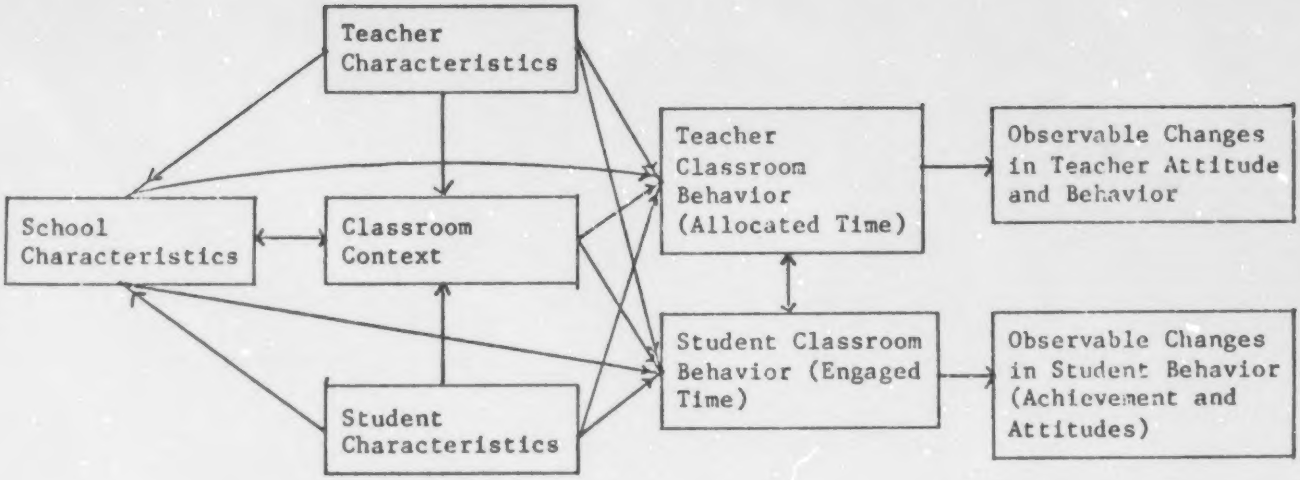
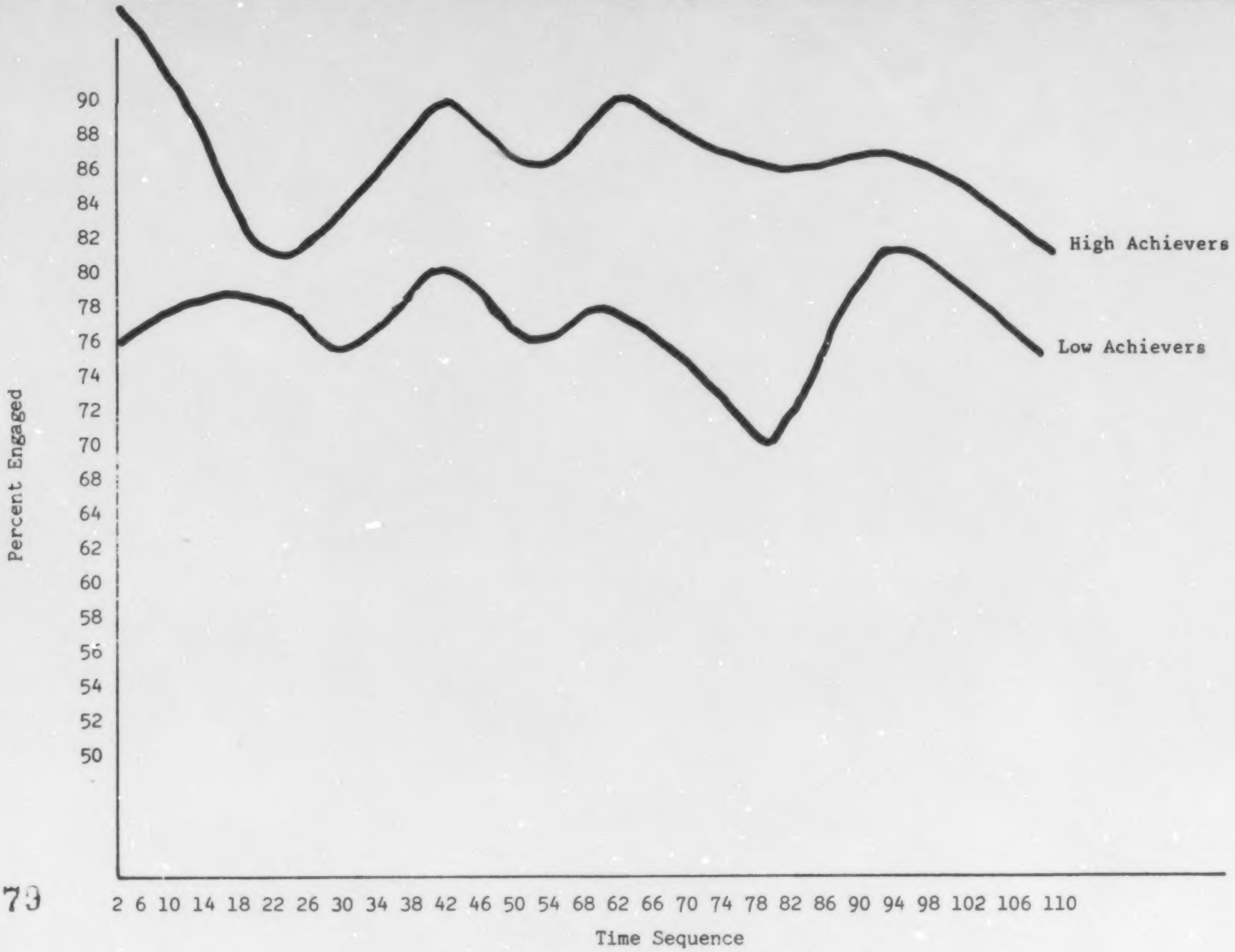

Teacher Characteristics
School Characteristics
Classroom Context
Student Characteristics
Teacher Classroom Behavior (Allocated Time)
Student Classroom Behavior (Engaged Time)
Observable Changes in Teacher Attitude and Behavior
Observable Changes in Student Behavior (Achievement and Attitudes)

Figure 1

A Conceptual Model for Studying Time on Task

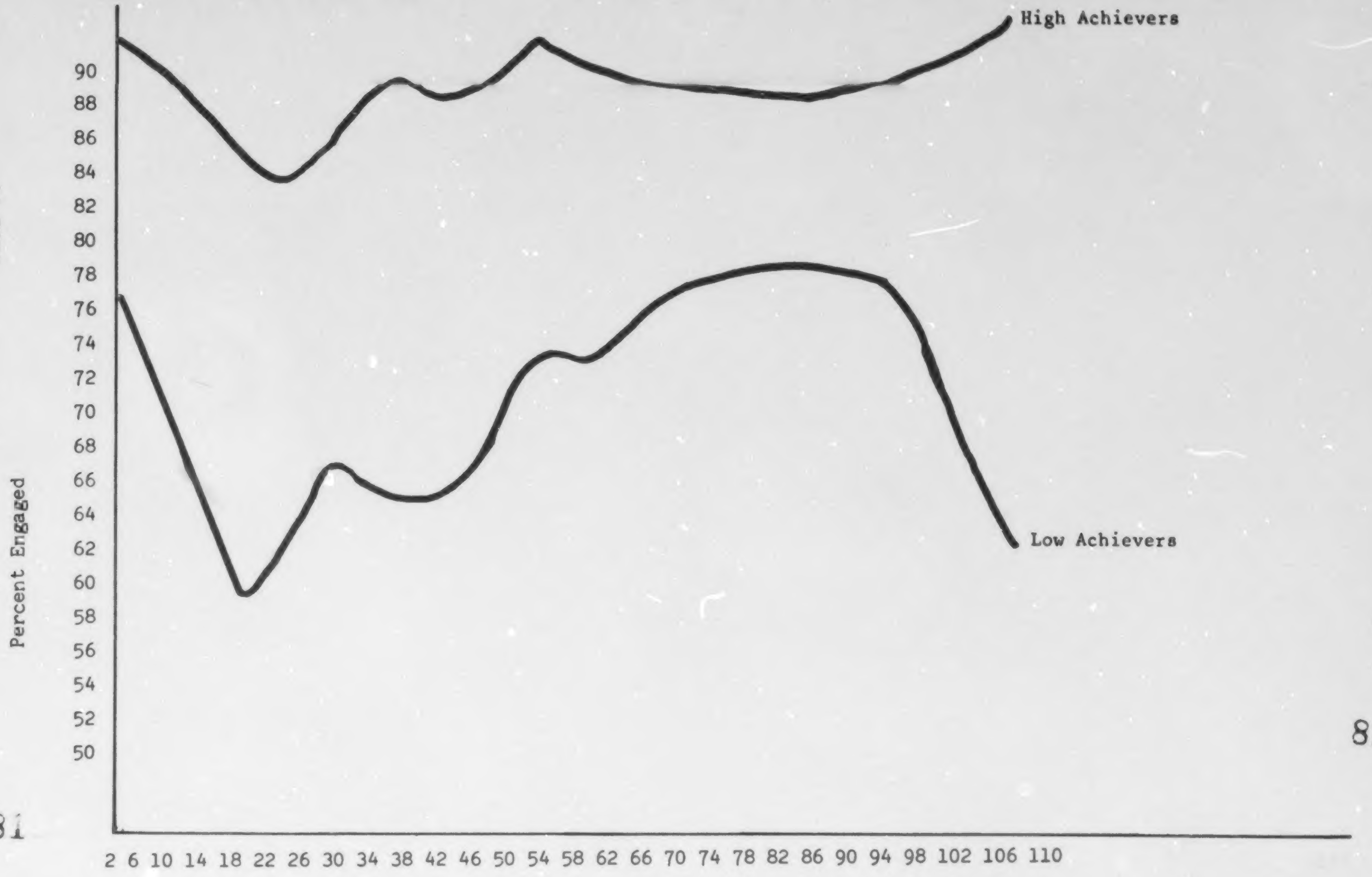


Each Segment Represents a Three Minute Interval

Figure 2

Engagement Rates of Low and High Achievers Over Time

Grade 2



Each Segment Represents a Three Minute Interval

Figure 3

Engagement Rates of Low and High Achievers Over Time

Grade 4

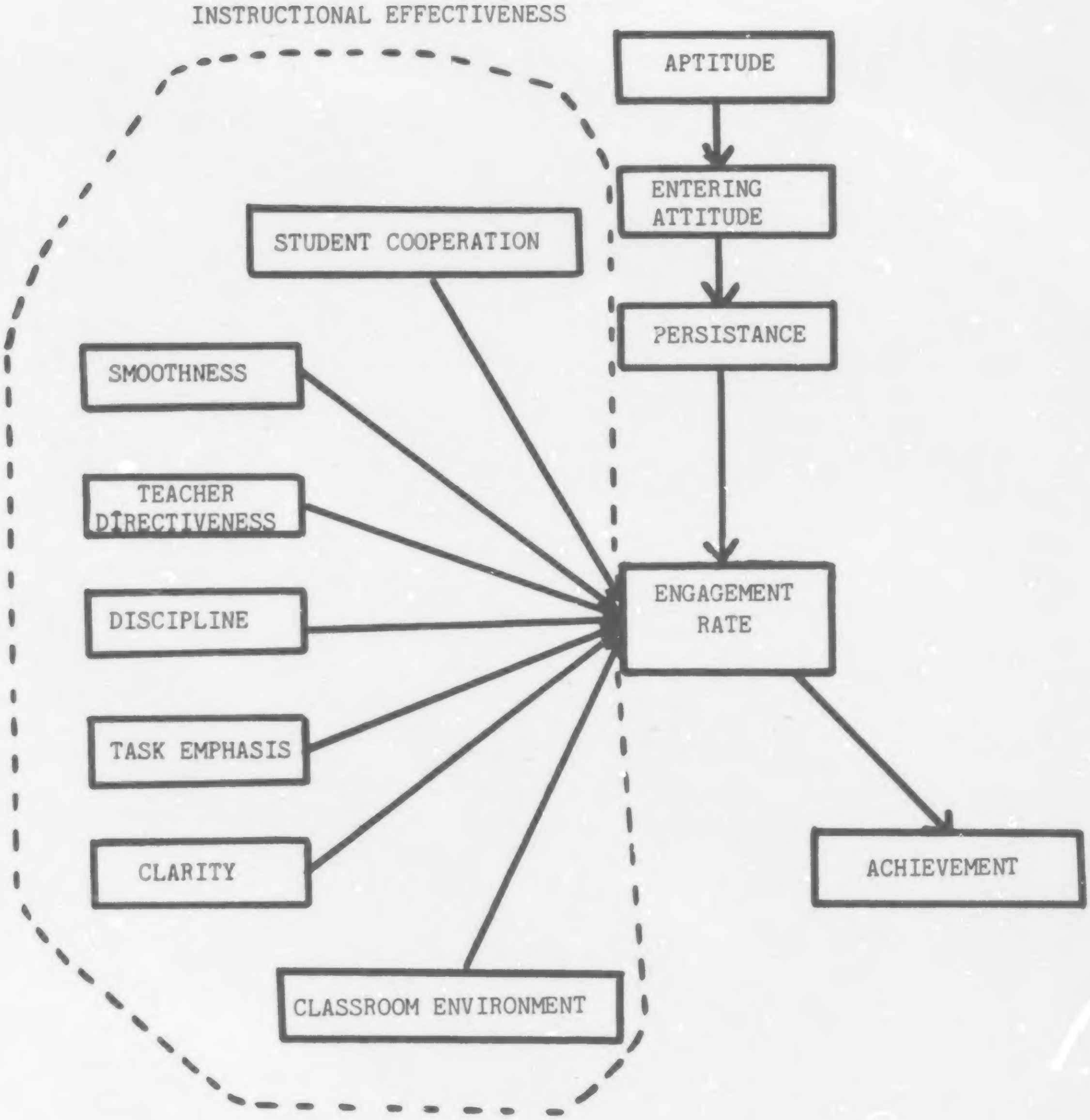

INSTRUCTIONAL EFFECTIVENESS
APTITUDE
ENTERING ATTITUDE
STUDENT COOPERATION
PERSISTANCE
SMOOTHNESS
TEACHER DIRECTIVENESS
DISCIPLINE
ENGAGEMENT RATE
TASK EMPHASIS
CLARITY
ACHIEVEMENT
CLASSROOM ENVIRONMENT

Figure 4

Inferential Model

TABLES

Table 1

Relative Meaning of High and Low Scores on the Student Attitude Scales

Dependence/Independence	Independent	Dependent
Behavior-degree of misbehavior	High	Low
Academic Futility	Not likely to be successful-effort will not pay off	Effort will pay off Will likely succeed
Feedback	Likes to check work and know where he stands	Does not like to check homework
Other Expectation for success	Others expect student to do well	Others do not have high expectations
Conscientiousness	High	Low
Internal Motivation	External Direction	Internal Direction
Student Self Concept-Expectation for Academic success	High	Low
Academic Futility(1)	Effort will be of little use	Effort will pay off There is a relationship
Future Evaluation(1)	Can go far or do well in school	Can't go far or do well in school
Teacher Push(1)	Little teacher effort to help students	Teachers are concerned and want students to be successful
Present Evaluation(1)	Student believes others think he is very capable	Student believes others think he has little ability.
Academic Norms(1)	School emphasizes quality work	School does not emphasize quality work

(1) From Brookover's Instrument

Table 2

Correlations Between Questions from the Attitude Inventory on the Dependence/Independence Scale

All Grades

	Question							
	7	15	23	31(1)	39	48	51	
7	—	.27	.50	.17	.30	.04	.02	
15		—	.38	.25	.33	.10	.07	
23			—	.23	.37	.05	.07	
31				—	.21	.04	.04	
39					—	.08	.08	
48						—	.04	
51							—	
53								—

(1) Reversed

Scale Reliability = .60

Table 3

Correlations Between Questions from the Attitude Inventory on the Behavior Scale

All Grades

	Question					
	6	14	22	30	38	47
6	–	.46	.46	.28	.32	.29
14		–	.61	.27	.29	.26
22			–	.28	.30	.29
30				–	.34	.31
38					–	.41
47						–

Scale Reliability = .75

Table 4

Correlations Between Questions from the Attitude Inventory on the Sense of Academic Futility Scale

All Grades

	Question					
	5	13	21	29[(1)]	37	46
5	–	.20	.24	.02	.17	.12
13		–	.22	.11	.22	.25
21			–	.08	.18	.18
29				–	.12	.14
37					–	.18
46						–

(1) Reversed

Scale Reliability = .54

Table 5

Correlations Between Questions from the Attitude Inventory on the Feedback Scale

All Grades

	Question					
	8(1)	16	24	32	40	45
8	–	.27	.08	-.10	.02	.18
16		–	.24	-.05	.14	.25
24			–	.01	.04	.11
32				–	.07	-.25
40					–	.09
45						–

(1) Reversed

Scale Reliability = .46

Table 6

Correlations Between Questions from the Attitude Inventory on the Other Expectation for Success Scale

All Grades

	Question					
	4	12	20	28	36	44
4	—	.06	-.01	.08	.03	.09
12		—	.07	.24	.08	.25
20			—	.05	.19	.14
28				—	.19	.28
36					—	.18
44						—

Scale Reliability = .47

Table 7

Correlations Between Questions from the Attitude Inventory on the Conscientiousness Scale

All Grades

	Question							
	3(1)	11(1)	19	27(1)	35	43(1)	50	52(1)
3	_	.30	.13	.25	.20	.20	.11	.22
11		_	.26	.18	.13	.33	.09	.33
19			_	.05	.09	.20	.11	.19
27				_	.26	.18	.12	.20
35					_	.09	.17	.16
43						_	.09	.28
50							_	.08
52								_

(1) Reversed for Scoring

Scale Reliability = .64

Table 8

Correlations Between Questions from the Attitude Inventory on the Internal Motivation Scale

All Grades

	Question					
	2	10	18(1)	26(1)	34	42
2	—	.12	-.02	-.04	.22	.02
10		—	+.09	+.05	.21	.16
18			—	+.22	+.09	+.19
26				—	+.02	+.17
34					—	.17
42						—

(1) Reversed

Scale Reliability = .44

Table 9

Correlations Between Questions from the Attitude Inventory on the Student Self Concept Scale

All Grades

	Question						
	1	9	17	25	33	41	49
1	_	.55	.12	.30	.11	.16	.27
9		_	.15	.31	.14	.15	.28
17			_	.18	.21	.19	.23
25				_	.17	.20	.54
33					_	.25	.22
41						_	.26
49							_

Scale Reliability = .69

Table 10

Correlations Between Questions from Brookover's Instrument
Academic Futility Scale

All Grades

	Question											
	9	16	17	18	20	21	22(1)	23	24	35	36	39
9	—	.14	.17	.19	.06	.03	.02	.09	.10	.08	.16	.10
16		—	.38	.39	.13	.20	.05	.15	.18	.15	.07	.11
17			—	.69	.18	.22	.03	.24	.15	.22	.11	.16
18				—	.13	.22	.03	.22	.16	.19	.14	.14
20					—	.42	.06	.29	.30	.21	.09	.19
21						—	.22	.44	.31	.16	.15	.14
22							—	.03	.05	.05	.10	.04
23								—	.32	.10	.16	.14
24									—	.20	.10	.18
35										—	.06	.20
36											—	.28
39												—

(1) Reversed for Scoring

Scale Reliability = .71

Table 11

Correlations Between Questions from Brookover's Instrument Future Evaluation and Expectation Scale

All Grades

	Question									
	5	6	11	33	40	49(1)	50(1)	51	55(1)	56(1)
5	—	.54	.11	.35	.30	+.19	+.17	.39	+.31	+.23
6		—	.04	.45	.35	+.30	+.25	.45	+.39	+.32
11			—	.24	.15	+.10	+.07	.15	+.13	+.10
33				—	.44	+.32	+.29	.42	+.33	+.30
40					—	+.32	+.34	.45	+.37	+.32
49						—	+.68	+.32	+.43	+.38
50							—	+.26	+.40	+.46
51								—	+.54	+.40
55									—	+.62
56										—

(1) Reversed for scoring

Scale Reliability = .82

Table 12

Correlations Between Questions from Brookover's Instrument Teacher Push and Norms Scale

All Grades

	Question			
	34	44	47	48
34	_	.23	.18	.14
44		_	.40	.32
47			_	.38
48				_

Scale Reliability = .60

Table 13

Correlations Between Questions from Brookover's Instrument
Present Evaluation and Expectations Scale

All Grades

	Question					
	41	42	43	52	53	54
41	—	.30	.41	.39	.25	.38
42		—	.51	.28	.43	.41
43			—	.31	.37	.50
52				—	.40	.47
53					—	.42
54						—

Scale Reliability = .79

Table 14

Correlations Between Questions from Brookover's Instrument Academic Norms Scale

All Grades

	Question					
	7	8	13	14	45	50
7	–	.32	.29	.32	.07	.03
8		–	.22	.20	.06	.05
13			–	.51	.10	.08
14				–	.14	.09
45					–	.17
50						–

Scale Reliability = .53

Table 15

Correlations Between Questions from the Attitude Inventory Combination of Conscientiousness and Motivation Scales

All Grades

	Question													
	$2^{(1)}$	$3^{(1)}$	$10^{(1)}$	$11^{(1)}$	18	19	26	$27^{(1)}$	$34^{(1)}$	35	$42^{(1)}$	$43^{(1)}$	50	$52^{(1)}$
2	-	.07	.12	-.01	-.02	-.14	-.04	.07	.22	-.01	.02	.02	-.00	.05
3		-	.18	.30	.17	.13	.08	.25	.20	.20	.21	.20	.11	.22
10			-	.06	.09	-.14	.05	.21	.21	.05	.16	.01	.02	.06
11				-	.14	.26	.03	.18	.05	.13	.15	.33	.10	.34
18					-	.10	.22	.16	.09	.17	.19	.12	.11	.07
19						-	.04	.06	-.06	.09	.07	.20	.11	.19
26							-	.10	.02	.12	.18	.02	.05	.03
27								-	.21	.27	.28	.18	.12	.20
34									-	.07	.17	.08	.04	.07
35										-	.17	.10	.17	.16
42											-	.10	.07	.13
43												-	.09	.28
50													-	.08
52														-

(1) Questions Reversed for scoring

Reliability =0.70

Table 16

Interscale Correlations

	Scale												
	Dependence/ Independence	Behavior	Academic Futility	Feed back	Other Expectations For Success	Conscientiousness	Internal Motivation	Student Self Concept	(1) Academic Futility	(1) Future Evaluation	(1) Teacher Push	(1) Present Evaluation	(1) Academic Norms
Dependence/ Independence	—	.16	.11	-.03	-.02	-.15	.17	.01	.03	.00	.14	.07	-.10
Behavior		—	.30	-.06	-.10	-.44	.33	-.21	.26	-.22	.08	-.10	.08
Academic Futility			—	-.10	-.07	-.24	.41	-.19	.39	-.26	.01	-.09	.06
Feedback				—	.15	.10	-.07	.14	-.05	.11	-.08	.06	.16
Other Expectation For Success					—	.20	.00	.34	-.06	.20	-.11	.17	.16
Conscientiousness						—	-.27	.37	-.19	.27	-.05	.23	.13
Internal Motivation							—	-.10	.30	-.21	.01	-.07	.01
Student Self Concept								—	-.16	.34	-.06	.40	.11
Academic Futility									—	-.32	.10	-.09	-.03
Future Evaluation										—	.25	-.41	-.32
Teacher Push											—	.19	.35
Present Evaluation												—	.21
Academic Norm													—

(1) From Brookover's Instrument

TABLE 17

Student Engagement Rates Across subject Area, Expressed as Percents

Grade 2

	Student Achievement Level			
Subject	High	Above Average	Below Average	Low
Math	85%	81%	80%	79%
Science(1)	NA	NA	NA	NA
Social Studies	94%	91%	88%	90%
Health	85%	84%	83%	83%
Reading	85%	83%	81%	82%
Language Arts	87%	84%	83%	80%
Physical Education	81%	79%	78%	84%
Music	95%	96%	95%	91%
Art	84%	84%	81%	85%
Non-Academic	85%	85%	85%	82%

(1) Too few observations (N < 100) to be considered stable.

TABLE 18

Student Engagement Rates Across Subject Area, Expressed as Percents
Grade 3

	Student Achievement Level			
Subject	High	Above Average	Below Average	Low
Math	87%	83%	76%	79%
Science(1)	NA	NA	NA	NA
Social Studies	88%	89%	85%	85%
Health	88%	89%	87%	84%
Reading	85%	82%	84%	72%
Language Arts	82%	82%	82%	76%
Physical Education	90%	90%	88%	89%
Music	93%	90%	89%	88%
Art	87%	88%	86%	81%
Non-Academic	85%	84%	81%	85%

(1) Too few observations (N ∠100) to be considered stable

TABLE 19

Student Engagement Rates Across Subject Area, Expressed as Percents
Grade 4

	Student Achievement Level			
Subject	High	Above Average	Below Average	Low
Math	86%	86%	85%	75%
Science	91%	85%	88%	77%
Social Studies	90%	88%	87%	81%
Health	90%	85%	89%	85%
Reading	87%	82%	86%	77%
Language Arts	87%	85%	84%	81%
Physical Education	91%	94%	93%	88%
Music	94%	93%	91%	88%
Art	84%	88%	86%	78%
Non-Academic	89%	89%	87%	86%

TABLE 20

Student Engagement Rates Across Subject Area, Expressed as Percents
Grade 5

	Student Achievement Level			
Subject	High	Above Average	Below Average	Low
Math	88%	86%	88%	83%
Science	91%	89%	84%	84%
Social Studies	93%	90%	91%	87%
Health	94%	89%	87%	85%
Reading	90%	86%	83%	76%
Language Arts	87%	88%	84%	78%
Physical Education	89%	89%	85%	87%
Music	96%	93%	91%	88%
Art	90%	87%	84%	83%
Non-Academic	89%	87%	88%	87%

TABLE 21

Student Engagement Rates Across Subject Area, Expressed as Percents

Grade 6

	Student Achievement Level			
Subject	High	Above Average	Below Average	Low
Math	86%	86%	85%	77%
Science	88%	82%	84%	81%
Social Studies	93%	90%	93%	87%
Health	89%	88%	86%	81%
Reading	85%	88%	85%	81%
Language Arts	89%	89%	85%	84%
Physical Education	81%	86%	78%	82%
Music	91%	88%	93%	92%
Art	82%	81%	84%	79%
Non-Academic	86%	87%	85%	85%

Table 22

Percent of Time Students Spend in Each Type of Activity Format Grade 2

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	1.91	2.05	2.08	2.08
Physical Movement	3.09	2.85	2.98	2.88
Transition	9.44	9.36	9.57	9.65
Listening	31.46	31.81	32.12	32.13
Speaking	0.92	0.80	0.68	0.77
Writing	34.85	35.44	35.02	35.22
Reading	7.06	6.51	6.40	6.19
Boardwork	0.16	0.19	0.18	0.22
Group Activities	2.26	2.38	2.31	2.40
Inactive	7.72	7.65	7.50	7.37
Other	1.11	0.96	1.11	1.09

Table 23

Percent of Time Students Spend in Each Type of Activity Format Grade 3

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	2.22	2.46	2.31	2.47
Physical Movement	3.41	3.21	3.52	3.71
Transition	10.38	10.56	10.63	10.80
Listening	34.33	35.05	34.05	34.65
Speaking	0.88	0.74	0.77	0.92
Writing	31.66	31.81	32.01	32.39
Reading	6.62	5.76	6.08	5.12
Boardwork	0.14	0.10	0.27	0.13
Group Activities	2.40	2.45	2.37	2.17
Inactive	7.18	7.01	7.05	7.06
Other	0.78	0.86	0.93	0.58

Table 24

Percent of Time Students Spend in Each Type of Activity Format Grade 4

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	1.56	1.69	1.58	1.84
Physical Movement	3.76	4.04	4.01	3.69
Transition	10.57	10.81	10.86	11.23
Listening	33.61	34.79	34.61	34.88
Speaking	1.37	0.80	0.94	0.82
Writing	31.05	30.73	30.63	30.18
Reading	7.22	6.12	6.85	5.68
Boardwork	0.07	0.10	0.01	0.07
Group Activities	4.21	4.36	4.20	4.51
Inactive	5.75	5.80	5.67	6.28
Other	0.83	0.74	0.64	0.83

Table 25

Percent of Time Students Spend in Each Type of Activity Format Grade 5

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	2.13	2.18	2.26	2.41
Physical Movement	4.19	4.22	4.56	4.27
Transition	10.38	10.37	10.31	10.76
Listening	34.19	34.30	34.74	34.37
Speaking	0.67	0.57	0.61	0.52
Writing	27.90	29.07	28.28	29.10
Reading	9.36	8.25	8.01	7.12
Boardwork	0.05	0.01	0.00	0.16
Group Activities	3.46	3.31	3.47	3.58
Inactive	6.82	6.82	6.82	6.95
Other	0.84	0.90	0.94	0.76

Table 26

Percent of Time Students Spend in
Each Type of Activity Format

Grade 6

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	1.38	1.39	1.43	1.46
Physical Movement	5.74	5.90	5.37	5.50
Transition	9.05	9.20	9.05	9.32
Listening	32.37	34.04	34.07	33.73
Speaking	0.91	0.78	0.79	0.69
Writing	30.33	29.63	29.46	28.53
Reading	7.86	7.75	8.17	8.75
Boardwork	0.01	0.01	0.00	0.03
Group Activities	5.41	4.73	4.86	5.23
Inactive	6.21	5.72	6.23	6.26
Other	0.74	0.85	0.57	0.50

Table 27

Student Engagement Rates Across Instructional Activity Formats or Expectations Grade 2

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	97	92	97	93
Physical Movement	88	92	86	87
Transition	92	92	91	90
Listening	95	93	93	92
Writing	82	80	78	76
Reading	87	86	84	87
Group Activities	94	95	91	95

Table 28

Student Engagement Rates Across Instructional Activity Formats or Expectations Grade 3

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	98	93	94	93
Physical Movement	93	91	87	87
Transition	90	90	88	88
Listening	92	91	90	87
Writing	87	83	81	73
Reading	83	80	78	70
Group Activities	96	92	96	94

Table 29

Student Engagement Rates Across Instructional Activity Formats or Expectations Grade 4

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	97	95	96	93
Physical Movement	89	91	89	92
Transition	93	93	94	91
Listening	93	92	91	88
Writing	84	84	82	76
Reading	87	78	83	72
Group Activities	97	96	98	97

Table 30

Student Engagement Rates Across Instructional Activity Formats or Expectations
Grade 5

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	98	97	92	91
Physical Movement	92	92	90	90
Transition	95	94	93	91
Listening	96	94	94	90
Writing	88	84	80	76
Reading	87	86	87	74
Group Activities	98	98	88	95

Table 31

Student Engagement Rates Across Instructional Activity Formats or Expectations Grade 6

Task Expectation	Student Achievement Level			
	High	Above Average	Below Average	Low
Music	95	93	96	94
Physical Movement	88	91	89	86
Transition	92	92	93	92
Listening	93	92	92	90
Writing	86	85	82	80
Reading	78	83	80	77
Group Activities	93	95	96	95

Table 32

Student Engagement Rates Across Instructional Pacing Format Expressed as Percents

Grade	Type	Student Achievement Level High	Above Average	Below Average	Low
2	Self Paced	80	77	75	75
	Other Paced	89	88	87	86
3	Self Paced	83	78	77	69
	Other Paced	89	87	86	84
4	Self Paced	82	80	80	74
	Other Paced	90	90	90	86
5	Self Paced	84	82	77	74
	Other Paced	92	90	90	86
6	Self Paced	80	81	78	76
	Other Paced	91	90	90	88

Table 33

Student Engagement Rates as a Function of Group Membership Size Expressed as Percents

Grade 2

Group Size	Student Achievement Level			
	High	Above Average	Below Average	Low
One Person	80	78	73	72
Two People	91(1)	82(1)	(2)	(2)
Three People	79	86(1)	90	(2)
Four or more	86	84	83	82

(1) Limited Data 0 < N < 100
(2) Insufficient Data N < 50

Table 34

Student Engagement Rates as a Function of Group Membership Size Expressed as Percents
Grade 3

Group Size	Student Achievement Level			
	High	Above Average	Below Average	Low
One Person	93	80(1)	74	85(1)
Two People	100(1)	93(1)	93(1)	(2)
Three People	100(1)	(2)	(2)	(2)
Four or more	87	84	83	79

(1) Limited Data $0 < N < 100$
(2) Insufficient Data $N < 50$

Table 35

Student Engagement Rates as a Function of Group Membership Size Expressed as Percents Grade 4

Group Size	Student Achievement Level High	Above Average	Below Average	Low
One Person	78	77	84	84
Two People	78(1)	93(1)	96(1)	76(1)
Three People	83(1)	86(1)	(2)	(2)
Four or more	88	86	86	82

(1) Limited Data 0< N<100
(2) Insufficient Data N<50

Table 36

Student Engagement Rates as a Function of Group Membership Size Expressed as Percents Grade 5

Group Size	Student Achievement Level			
	High	Above Average	Below Average	Low
One Person	85	77	78	53(1)
Two People	100(1)	96(1)	69(1)	88
Three People	93(1)	(2)	(2)	95(1)
Four or more	89	87	86	82

(1) Limited Data $0 < N < 100$
(2) Insufficient Data $N < 50$

Table 37

Student Engagement Rates as a Function of Group Membership Size
Expressed as Percents
Grade 6

Group Size	Student Achievement Level High	 Above Average	 Below Average	 Low
One Person	65 (1)	74	70 (1)	73
Two People	87	87	92	88 (1)
Three People	78	85	(2)	89 (1)
Four or more	87	87	85	83

(1) Limited Data 0 < N < 100
(2) Insufficient Data N < 50

TABLE 38

Summary of Significant Findings Correlating Engagement Rates with High Inference Variables Across Grade Level and Student Achievement Level

		Achievement Level			
Variable	Grade	High	Medium High	Medium Low	Low
Class size	2	+	-		
	3				
	4				
	5				
	6		-		
Number of Minority Students	2	+		+	
	3	++	-		+
	4	+		+	
	5		++		+
	6	++	+		
Amount of Teacher Directiveness	2	++	+	++	++
	3				++
	4	+	+		+
	5	++	+	++	++
	6	++	++	++	++
Amount of Discipline Problems	2	--	--	--	--
	3	--	--	--	--
	4	--	--	--	--
	5	--	--	--	--
	6	--	--	--	--
Emphasis on Warmth/ Effect	2				
	3				
	4	++		+	
	5	+	++		
	6				+

TABLE 38 continued

Variable	Grade	High	Medium High	Medium Low	Low
Task Emphasis	2	++		++	++
	3	++		++	++
	4	+	+	++	+
	5	++	++	++	++
	6	++	++	++	++
Clarity of Presentation	2	++	++	++	++
	3	++	+	+	++
	4	++	+	++	
	5	++	++	++	++
	6	++	+	++	++
Degree of Individualization	2	--	--	--	--
	3				
	4		-		--
	5	-		--	--
	6	--	--	--	--
Amount of Student Choice	2				
	3				
	4				
	5			-	
	6	--	--	--	-
Smoothness of Shifts Between Activities	2	++	++	++	++
	3	++		++	++
	4	++	++	++	++
	5	++	++	++	++
	6	++	++	++	++
Degree Which Students Are Held Responsible	2			++	
	3	+		++	++
	4	++	++	++	++
	5	++	++	++	++
	6	++	++	++	++

T-38 continued

TABLE 38 continued

Variable	Grade	High	Medium High	Medium Low	Low
Amount of Student Cooperation	2	++	++	++	++
	3	++		++	++
	4	+	++	++	++
	5	++	++	++	++
	6	++	++	++	++
Amount of Flexibility	2				
	3				
	4				
	5				-
	6	-		-	
Degree to Which Class Was Kept on Task	2	++	++	++	++
	3	++	+	++	++
	4	++	++	++	++
	5	++	++	++	++
	6	++	++	++	++
Amount of Process Evaluation	2				
	3				+
	4			+	+
	5	++		++	+
	6	++		++	+
Amount of Student Movement	2	--	--	--	--
	3	--	--	--	--
	4	-		-	
	5	--	-	--	
	6	--	--	--	--
Degree of Student Self-initiation	2				+
	3				+
	4				
	5	+	+		
	6				

T-38 continued

TABLE 38 continued

Variable	Grade	High	Medium High	Medium Low	Low
Degree That Students Approach The Teacher	2			+	
	3			-	
	4		--		-
	5				
	6				
Amount of Direct Teacher Presentation	2	++	++	+	++
	3				
	4	++			
	5	++	++	++	++
	6	++	+	++	++
Amount of Assigned Homework	2				
	3		-		
	4	-	-	-	
	5				
	6				
Amount of Controlled Practice of New Material	2				
	3		+		
	4	+			
	5	+	++	+	
	6				
Degree of Monitoring of Seatwork	2		--	-	-
	3				
	4				
	5				
	6				
Noise Level	2	--	--	--	--
	3	--	-	--	--
	4	--		--	
	5	--	-	--	-
	6	--	--	--	--

T-38 continued

TABLE 38 continued

Variable	Grade	High	Medium High	Medium Low	Low
Amount of Wall Displays	2				
	3				
	4				
	5	++		+	
	6	+		+	
Room Temperature	2		-		
	3				
	4				
	5				
	6	--	--		

±± = $p \leq 0.01$

± = $p \leq 0.05$

T-38 continued

ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed: 2

TABLE 39

- - - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - - -

	DEM1	DEM2	INF1	INF2	INF3	INF4	INF5	INF6	INF7	INF8
ENG1	0.1195 (268) P=0.025	0.1460 (209) P=0.017	0.2451 (177) P=0.001	-0.2941 (177) P=0.000	0.0456 (177) P=0.273	0.2433 (171) P=0.001	0.2515 (164) P=0.001	-0.2975 (161) P=0.000	-0.0831 (163) P=0.146	0.2485 (170) P=0.001
ENG2	0.2244 (267) P=0.000	0.0820 (208) P=0.120	0.1622 (175) P=0.016	-0.2937 (174) P=0.000	0.0482 (174) P=0.264	0.1096 (169) P=0.078	0.2357 (162) P=0.001	-0.2673 (159) P=0.000	-0.0810 (161) P=0.153	0.2280 (168) P=0.001
ENG3	0.0297 (267) P=0.314	0.1442 (208) P=0.019	0.2283 (176) P=0.001	-0.2871 (175) P=0.000	-0.0109 (175) P=0.443	0.2348 (169) P=0.001	0.2277 (163) P=0.002	-0.2169 (160) P=0.003	-0.0626 (161) P=0.215	0.3063 (168) P=0.000
ENG4	0.0844 (266) P=0.085	-0.0531 (207) P=0.224	0.1753 (176) P=0.010	-0.3037 (175) P=0.000	-0.0520 (175) P=0.247	0.1850 (168) P=0.008	0.2204 (163) P=0.002	-0.1490 (160) P=0.030	-0.0476 (161) P=0.275	0.2437 (167) P=0.001

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

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ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    2
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TABLE 39
(continued)

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- - - - - - - - - - - - -P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S- - - - - - - - - - - -

            INF9       INF10      INF11      INF12      INF13      INF14      INF15      INF16      INF17      INF18

ENG1       0.0890     0.2760     0.0942     0.3318     0.0564    -0.3385     0.0770    -0.1105     0.2315    -0.0741
          (  167)    (  170)    (  127)    (  169)    (  120)    (  169)    (  151)    (  154)    (  161)    (   55)
          P=0.126    P=0.000    P=0.146    P=0.000    P=0.270    P=0.000    P=0.174    P=0.086    P=0.002    P=0.295

ENG2       0.0418     0.2894     0.0594     0.2179     0.0064    -0.2802     0.0812    -0.1336     0.1936    -0.0754
          (  165)    (  168)    (  126)    (  167)    (  119)    (  168)    (  149)    (  152)    (  159)    (   54)
          P=0.297    P=0.000    P=0.254    P=0.002    P=0.473    P=0.000    P=0.163    P=0.050    P=0.007    P=0.294

ENG3       0.1846     0.3435    -0.0581     0.2973     0.1311    -0.3864     0.0862    -0.1377     0.1368    -0.1126
          (  165)    (  168)    (  126)    (  167)    (  120)    (  168)    (  150)    (  152)    (  160)    (   55)
          P=0.009    P=0.000    P=0.259    P=0.000    P=0.077    P=0.000    P=0.147    P=0.045    P=0.042    P=0.207

ENG4       0.0802     0.2591     0.0266     0.2480     0.1122    -0.1964     0.1347    -0.0709     0.2317     0.1151
          (  164)    (  168)    (  127)    (  167)    (  119)    (  168)    (  150)    (  152)    (  160)    (   54)
          P=0.154    P=0.000    P=0.383    P=0.001    P=0.112    P=0.005    P=0.050    P=0.193    P=0.002    P=0.204

(COEFFICIENT / (CASES) / SIGNIFICANCE)      (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

T-39 continued

```
ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    2
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TABLE 39
(continued)

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- - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - - - - - - - - - - -

          INF19      INF20      INF21      INF22      INF23

ENG1      -0.0365    -0.0524    -0.2806    -0.0193    -0.0539
          (  124)    (  126)    (  176)    (  166)    (  177)
          P=0.344    P=0.280    P=0.000    P=0.403    P=0.238

ENG2      -0.0383    -0.2102    -0.2437    -0.0711    -0.1587
          (  123)    (  125)    (  174)    (  165)    (  176)
          P=0.337    P=0.009    P=0.001    P=0.182    P=0.018

ENG3       0.0053    -0.1723    -0.3542    -0.0805    -0.1064
          (  124)    (  125)    (  175)    (  165)    (  176)
          P=0.477    P=0.027    P=0.000    P=0.152    P=0.080

ENG4      -0.0155    -0.1579    -0.2475    -0.0774    -0.0676
          (  123)    (  125)    (  175)    (  165)    (  176)
          P=0.432    P=0.039    P=0.000    P=0.161    P=0.187

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1	Class Size
DEM- 2	Number of Minority Students
INF- 1	Amount of Teacher Directiveness
INF- 2	Amount of Discipline Problems
INF- 3	Emphasis on Warmth/Effect
INF- 4	Task Emphasis
INF- 5	Clarity of Presentation
INF- 6	Degree of Individualization
INF- 7	Amount of Student Choice
INF- 8	Smoothness of Shifts Between Activities
INF- 9	Degree Which Students Are Held Responsible
INF-10	Amount of Student Cooperation
INF-11	Amount of Flexibility
INF-12	Degree to Which Class was Kept on Task
INF-13	Amount of Process Evaluation
INF-14	Amount of Student Movement
INF-15	Degree of Student Self-initiation
INF-16	Degree That Students Approach The Teacher
INF-17	Amount of Direct Teacher Presentation
INF-18	Amount of Assigned Homework
INF-19	Amount of Controlled Practice of New Material
INF-20	Degree of Monitoring of Seatwork
INF-21	Noise Level
INF-22	Amount of Wall Displays
INF-23	Room Temperature

T-39 continued

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ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    3                          TABLE  40

-------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S------------

          DEM1      DEM2      INF1      INF2      INF3      INF4      INF5      INF6      INF7      INF8

ENG1     -0.0747    0.1534    0.0646   -0.3324    0.0806    0.2093    0.1968   -0.1162   -0.0181    0.2344
         (  314)   (  258)   (  185)   (  187)   (  191)   (  174)   (  175)   (  165)   (  164)   (  175)
         P=0.093   P=0.007   P=0.191   P=0.000   P=0.134   P=0.003   P=0.005   P=0.069   P=0.409   P=0.001

ENG2      0.0645   -0.1162    0.0704   -0.1952    0.0210    0.0391    0.1348   -0.0687    0.0668    0.1213
         (  308)   (  253)   (  181)   (  183)   (  187)   (  170)   (  171)   (  162)   (  161)   (  172)
         P=0.130   P=0.033   P=0.173   P=0.004   P=0.388   P=0.306   P=0.039   P=0.192   P=0.200   P=0.056

ENG3      0.0446   -0.0260    0.0794   -0.3920    0.0182    0.2509    0.1792   -0.0185   -0.0313    0.2230
         (  297)   (  246)   (  169)   (  171)   (  175)   (  160)   (  161)   (  150)   (  151)   (  161)
         P=0.222   P=0.343   P=0.152   P=0.000   P=0.405   P=0.001   P=0.011   P=0.411   P=0.352   P=0.002

ENG4     -0.0213    0.1137    0.2079   -0.3836    0.0216    0.2794    0.2223   -0.1237   -0.0818    0.3186
         (  288)   (  237)   (  166)   (  168)   (  172)   (  158)   (  160)   (  150)   (  151)   (  160)
         P=0.359   P=0.040   P=0.004   P=0.000   P=0.389   P=0.000   P=0.002   P=0.066   P=0.159   P=0.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

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ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    3                        TABLE 40
                                              (continued)

-------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S-------------

           INF9      INF10     INF11     INF12     INF13     INF14     INF15     INF16     INF17     INF18

ENG1       0.1314    0.2773    0.0518    0.2826    0.0843   -0.2682   -0.0426   -0.0427    0.1162   -0.0001
          ( 169)    ( 181)    ( 121)    ( 167)    ( 124)    ( 172)    ( 156)    ( 149)    ( 165)    (  52)
          P=0.044   P=0.000   P=0.286   P=0.000   P=0.176   P=0.000   P=0.299   P=0.302   P=0.069   P=0.500

ENG2       0.0485    0.1098    0.0389    0.1469    0.0531   -0.2429   -0.0643   -0.0594   -0.0613   -0.2333
          ( 165)    ( 178)    ( 118)    ( 163)    ( 122)    ( 169)    ( 153)    ( 146)    ( 162)    (  51)
          P=0.268   P=0.072   P=0.338   P=0.031   P=0.281   P=0.001   P=0.215   P=0.238   P=0.219   P=0.050

ENG3       0.2781    0.2445    0.0214    0.2862    0.0404   -0.3063   -0.0645   -0.1592    0.0713    0.0480
          ( 155)    ( 166)    ( 111)    ( 153)    ( 112)    ( 157)    ( 143)    ( 136)    ( 151)    (  49)
          P=0.000   P=0.001   P=0.412   P=0.000   P=0.336   P=0.000   P=0.222   P=0.032   P=0.192   P=0.372

ENG4       0.1961    0.2439    0.0701    0.3109    0.1884   -0.2423    0.1419   -0.1312    0.0761   -0.0932
          ( 154)    ( 165)    ( 111)    ( 152)    ( 115)    ( 157)    ( 143)    ( 137)    ( 153)    (  50)
          P=0.007   P=0.001   P=0.232   P=0.000   P=0.022   P=0.001   P=0.045   P=0.063   P=0.175   P=0.260

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

T-40 continued

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ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    3
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TABLE 40
(continued)

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- - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - - - - - - - - - - -

           INF19      INF20      INF21      INF22      INF23

ENG1       0.0235    -0.0556    -0.3056     0.0115     0.0891
          (  136)    (  139)    (  181)    (  171)    (  176)
          P=0.393    P=0.258    P=0.000    P=0.441    P=0.120

ENG2       0.1850    -0.0160    -0.1546    -0.0907     0.0293
          (  133)    (  136)    (  178)    (  168)    (  173)
          P=0.017    P=0.427    P=0.020    P=0.121    P=0.351

ENG3       0.0002    -0.1100    -0.3233    -0.1288     0.0146
          (  123)    (  124)    (  165)    (  155)    (  160)
          P=0.499    P=0.112    P=0.000    P=0.055    P=0.427

ENG4       0.1407    -0.0666    -0.2467    -0.0901    -0.0833
          (  128)    (  126)    (  163)    (  153)    (  159)
          P=0.057    P=0.229    P=0.001    P=0.134    P=0.142

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

T-40 continued

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ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    4                           TABLE 41

-------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S-------------

          DEM1       DEM2       INF1       INF2       INF3       INF4       INF5       INF6       INF7       INF8

ENG1     -0.0708     0.1321     0.1171    -0.1885     0.1495     0.1278     0.2299    -0.1058     0.0184     0.1511
         (  377)    (  303)    (  260)    (  262)    (  264)    (  247)    (  236)    (  241)    (  242)    (  236)
         P=0.085    P=0.011    P=0.030    P=0.001    P=0.008    P=0.022    P=0.000    P=0.051    P=0.388    P=0.010

ENG2     -0.0404     0.0214     0.1059    -0.1797    -0.0679     0.1200     0.1488    -0.1086    -0.0624     0.1667
         (  370)    (  297)    (  252)    (  255)    (  256)    (  241)    (  232)    (  233)    (  235)    (  228)
         P=0.219    P=0.357    P=0.047    P=0.002    P=0.140    P=0.031    P=0.012    P=0.049    P=0.171    P=0.006

ENG3     -0.0340     0.1251     0.0677    -0.2130     0.1308     0.1958     0.1824    -0.0803     0.0370     0.2033
         (  365)    (  289)    (  251)    (  254)    (  256)    (  238)    (  228)    (  233)    (  233)    (  228)
         P=0.259    P=0.017    P=0.143    P=0.000    P=0.018    P=0.001    P=0.003    P=0.111    P=0.287    P=0.001

ENG4     -0.0007     0.0544     0.1296    -0.1627     0.0081     0.1365     0.0840    -0.1668    -0.0041     0.2085
         (  363)    (  289)    (  245)    (  247)    (  249)    (  233)    (  223)    (  227)    (  229)    (  224)
         P=0.494    P=0.178    P=0.021    P=0.005    P=0.449    P=0.019    P=0.106    P=0.006    P=0.476    P=0.001

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

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ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    4
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TABLE 41
(continued)

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- - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - - - - - - - - - - - -

            INF9      INF10     INF11     INF12     INF13     INF14     INF15     INF16     INF17     INF18

ENG1       0.1933    0.1044    0.0577    0.2049    0.0915   -0.1399    0.0329   -0.0898    0.1950   -0.1601
          (  239)   (  255)   (  184)   (  244)   (  170)   (  240)   (  218)   (  231)   (  231)   (  107)
          P=0.001   P=0.048   P=0.218   P=0.001   P=0.118   P=0.015   P=0.315   P=0.087   P=0.001   P=0.050

ENG2       0.1836    0.2032   -0.0000    0.1888    0.0431   -0.0120    0.0227   -0.1550    0.0936   -0.1925
          (  230)   (  246)   (  179)   (  236)   (  166)   (  233)   (  212)   (  224)   (  223)   (  103)
          P=0.003   P=0.001   P=0.500   P=0.002   P=0.291   P=0.428   P=0.371   P=0.010   P=0.082   P=0.026

ENG3       0.1853    0.1676    0.1203    0.2754    0.1363   -0.1295    0.0779   -0.0262    0.0846   -0.1941
          (  229)   (  246)   (  177)   (  234)   (  165)   (  230)   (  208)   (  221)   (  221)   (  102)
          P=0.002   P=0.004   P=0.055   P=0.000   P=0.040   P=0.025   P=0.132   P=0.349   P=0.105   P=0.025

ENG4       0.1854    0.1512    0.0836    0.1729    0.1521    0.0101    0.0934   -0.1118    0.0701   -0.0973
          (  225)   (  241)   (  172)   (  228)   (  162)   (  224)   (  205)   (  218)   (  217)   (  102)
          P=0.003   P=0.009   P=0.138   P=0.004   P=0.027   P=0.440   P=0.091   P=0.050   P=0.152   P=0.165

(COEFFICIENT / (CASES) / SIGNIFICANCE)      (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

T-41 continued

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ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    4                          TABLE  42

- - - - - - - - - - - - -P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S- - - - - - - - - - - - -

            INF19      INF20      INF21      INF22      INF23

ENG1         0.1347    -0.0555    -0.1717    -0.0031     0.0146
            (  158)    (  211)    (  259)    (  256)    (  262)
            P=0.046    P=0.211    P=0.003    P=0.480    P=0.407

ENG2         0.0419    -0.0236    -0.0557    -0.0291    -0.0160
            (  153)    (  204)    (  251)    (  249)    (  254)
            P=0.303    P=0.369    P=0.190    P=0.324    P=0.400

ENG3         0.1215    -0.0132    -0.1505     0.0500    -0.0893
            (  154)    (  202)    (  251)    (  248)    (  254)
            P=0.067    P=0.426    P=0.009    P=0.217    P=0.078

ENG4         0.1277    -0.0343    -0.0010    -0.0600    -0.0533
            (  148)    (  198)    (  244)    (  241)    (  247)
            P=0.061    P=0.315    P=0.494    P=0.177    P=0.202

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

```
ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    5                        TABLE 42
                                               (continued)

------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S------------

           DEM1       DEM2       INF1       INF2       INF3       INF4       INF5       INF6       INF7       INF8

ENG1       0.0198     0.0026     0.1868    -0.1592     0.1260     0.2486     0.2283    -0.1265    -0.0578     0.2029
          (  393)    (  323)    (  294)    (  299)    (  301)    (  279)    (  270)    (  271)    (  262)    (  270)
          P=0.348    P=0.481    P=0.001    P=0.003    P=0.014    P=0.000    P=0.000    P=0.019    P=0.176    P=0.000

ENG2      -0.0287     0.1810     0.1345    -0.1461     0.1522     0.1567     0.2236    -0.0535     0.0161     0.2555
          (  391)    (  321)    (  292)    (  297)    (  299)    (  277)    (  268)    (  269)    (  261)    (  267)
          P=0.286    P=0.001    P=0.011    P=0.006    P=0.004    P=0.004    P=0.000    P=0.191    P=0.398    P=0.000

ENG3      -0.0255    -0.0435     0.3783    -0.2290     0.0233     0.3368     0.3079    -0.1763    -0.1278     0.2607
          (  385)    (  316)    (  289)    (  294)    (  296)    (  274)    (  265)    (  265)    (  257)    (  265)
          P=0.309    P=0.220    P=0.000    P=0.000    P=0.345    P=0.000    P=0.000    P=0.002    P=0.020    P=0.000

ENG4      -0.0067     0.1324     0.3355    -0.2199     0.0268     0.2444     0.2077    -0.1627    -0.0873     0.1896
          (  371)    (  302)    (  279)    (  282)    (  284)    (  264)    (  256)    (  257)    (  248)    (  258)
          P=0.449    P=0.011    P=0.000    P=0.000    P=0.326    P=0.000    P=0.000    P=0.004    P=0.085    P=0.001

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

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INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

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INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

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INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

T-42 continued

```
ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    5                              TABLE 43

------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S------------

          INF9      INF10     INF11     INF12     INF13     INF14     INF15     INF16     INF17     INF18

ENG1      0.2037    0.1730   -0.1100    0.2592    0.2262   -0.1703    0.1049    0.0310    0.2475   -0.0858
         (  268)   (  278)   (  199)   (  276)   (  197)   (  271)   (  248)   (  249)   (  256)   (   98)
         P=0.000   P=0.002   P=0.061   P=0.000   P=0.001   P=0.002   P=0.050   P=0.313   P=0.000   P=0.200

ENG2      0.1941    0.1790    0.0371    0.2479    0.1097   -0.1183    0.1125    0.0800    0.1980    0.0928
         (  265)   (  277)   (  198)   (  273)   (  196)   (  269)   (  247)   (  249)   (  254)   (   98)
         P=0.001   P=0.001   P=0.302   P=0.000   P=0.063   P=0.026   P=0.039   P=0.104   P=0.001   P=0.182

ENG3      0.3042    0.2481   -0.0018    0.3549    0.1708   -0.1864    0.0470   -0.0295    0.3253   -0.0186
         (  262)   (  274)   (  195)   (  270)   (  192)   (  267)   (  243)   (  245)   (  252)   (   98)
         P=0.000   P=0.000   P=0.490   P=0.000   P=0.009   P=0.001   P=0.233   P=0.323   P=0.000   P=0.428

ENG4      0.2482    0.1824   -0.1392    0.2755    0.1467   -0.0992    0.0409   -0.0287    0.1521   -0.1034
         (  253)   (  264)   (  189)   (  261)   (  188)   (  256)   (  237)   (  237)   (  244)   (   96)
         P=0.000   P=0.001   P=0.028   P=0.000   P=0.022   P=0.057   P=0.265   P=0.330   P=0.009   P=0.158

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

```
ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    5
```

TABLE 43
(continued)

```
-------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S------------

          INF19     INF20     INF21     INF22     INF23

ENG1       0.1593    0.0652   -0.1443    0.2085   -0.0089
          (  191)   (  230)   (  293)   (  288)   (  293)
          P=0.014   P=0.162   P=0.007   P=0.000   P=0.439

ENG2       0.1687    0.1063   -0.1222    0.0647   -0.0045
          (  192)   (  228)   (  291)   (  286)   (  291)
          P=0.010   P=0.055   P=0.019   P=0.138   P=0.470

ENG3       0.1591    0.0018   -0.1854    0.1247   -0.0232
          (  189)   (  228)   (  289)   (  285)   (  289)
          P=0.014   P=0.469   P=0.001   P=0.018   P=0.347

ENG4       0.1172    0.0036   -0.1300   -0.0242   -0.0239
          (  185)   (  221)   (  276)   (  272)   (  275)
          P=0.056   P=0.479   P=0.015   P=0.346   P=0.346


(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

INF- 9 Degree Which Students Are Held Responsible

INF-10 Amount of Student Cooperation

INF-11 Amount of Flexibility

INF-12 Degree to Which Class was Kept on Task

INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

T-43 continued

```
ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    6
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TABLE 44

```
------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S------------

            DEM1      DEM2      INF1      INF2      INF3      INF4      INF5      INF6      INF7      INF8

ENG1      -0.0525    0.1772    0.2827   -0.2743    0.0651    0.2966    0.1595   -0.2262   -0.2060    0.2750
          (  426)   (  314)   (  300)   (  308)   (  308)   (  284)   (  272)   (  280)   (  272)   (  274)
          P=0.140   P=0.001   P=0.000   P=0.000   P=0.127   P=0.000   P=0.004   P=0.000   P=0.000   P=0.000

ENG2      -0.0867    0.1057    0.1982   -0.2495    0.0619    0.2605    0.1176   -0.1561   -0.1716    0.2247
          (  412)   (  311)   (  290)   (  298)   (  298)   (  276)   (  265)   (  271)   (  264)   (  266)
          P=0.039   P=0.031   P=0.000   P=0.000   P=0.143   P=0.000   P=0.028   P=0.005   P=0.003   P=0.000

ENG3      -0.0286   -0.0222    0.1984   -0.2562    0.0582    0.2694    0.1750   -0.1691   -0.1524    0.2728
          (  396)   (  286)   (  285)   (  293)   (  293)   (  270)   (  259)   (  265)   (  259)   (  261)
          P=0.285   P=0.354   P=0.000   P=0.000   P=0.160   P=0.000   P=0.002   P=0.003   P=0.007   P=0.000

ENG4      -0.0523    0.0660    0.1994   -0.2828    0.0998    0.2588    0.2054   -0.1812   -0.1350    0.2398
          (  400)   (  296)   (  285)   (  292)   (  292)   (  272)   (  260)   (  266)   (  258)   (  261)
          P=0.148   P=0.129   P=0.000   P=0.000   P=0.044   P=0.000   P=0.000   P=0.002   P=0.015   P=0.000

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

INF- 2 Amount of Discipline Problems

INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

INF- 5 Clarity of Presentation

INF- 6 Degree of Individualization

INF- 7 Amount of Student Choice

INF- 8 Smoothness of Shifts Between Activities

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INF-11 Amount of Flexibility

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INF-13 Amount of Process Evaluation

INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

```
ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    6
```

TABLE 44
(continued)

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- - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - - - - - - - - - - - -

          INF9      INF10     INF11     INF12     INF13     INF14     INF15     INF16     INF17     INF18

ENG1     0.2386    0.2209   -0.1221    0.2884    0.1702   -0.2445    0.0741    0.0874    0.3177   -0.0758
        (  273)   (  295)   (  193)   (  286)   (  202)   (  288)   (  254)   (  265)   (  264)   (   95)
        P=0.000   P=0.000   P=0.045   P=0.000   P=0.008   P=0.000   P=0.120   P=0.078   P=0.000   P=0.233

ENG2     0.1881    0.2482   -0.0718    0.2768    0.0766   -0.1379    0.0931    0.0188    0.1029   -0.1355
        (  265)   (  286)   (  188)   (  277)   (  196)   (  278)   (  247)   (  256)   (  257)   (   92)
        P=0.001   P=0.000   P=0.164   P=0.000   P=0.143   P=0.010   P=0.072   P=0.383   P=0.050   P=0.099

ENG3     0.2773    0.1985   -0.1380    0.2949    0.1942   -0.2077    0.0186    0.0465    0.2400   -0.1318
        (  260)   (  281)   (  185)   (  272)   (  193)   (  273)   (  241)   (  252)   (  252)   (   88)
        P=0.000   P=0.000   P=0.031   P=0.000   P=0.003   P=0.000   P=0.387   P=0.231   P=0.000   P=0.111

ENG4     0.2723    0.2188   -0.0239    0.3222    0.1242   -0.1873    0.0681    0.0487    0.2167    0.0106
        (  261)   (  280)   (  185)   (  272)   (  193)   (  273)   (  241)   (  251)   (  252)   (   90)
        P=0.000   P 0.000   P=0.374   P=0.000   P=0.043   P=0.001   P=0.146   P=0.221   P=0.000   P=0.461


(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

INF- 1 Amount of Teacher Directiveness

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INF- 3 Emphasis on Warmth/Effect

INF- 4 Task Emphasis

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INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

T-44 continued

```
ENGAGEMENT RATES CORRELATED WITH HIGH INFERENCE VARIABLES
File:
FOUR ACHIEVEMENT LEVELS-SUBFILE EQUALS GRADE LEVEL

Subfiles processed:    6
```

TABLE 44
(continued)

```
------------P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S------------

           INF19     INF20     INF21     INF22     INF23

ENG1       0.0595   -0.0408   -0.2482    0.1344   -0.1341
          ( 197)    ( 235)    ( 306)    ( 289)    ( 299)
          P=0.203   P=0.267   P=0.000   P=0.011   P=0.010

ENG2      -0.0233   -0.1026   -0.1607    0.0192   -0.1682
          ( 193)    ( 229)    ( 298)    ( 279)    ( 288)
          P=0.374   P=0.061   P=0.003   P=0.375   P=0.002

ENG3       0.0706   -0.0062   -0.2321    0.1330   -0.0702
          ( 190)    ( 224)    ( 291)    ( 273)    ( 286)
          P=0.167   P=0.463   P=0.000   P=0.014   P=0.118

ENG4       0.0421   -0.0959   -0.1878    0.1352   -0.0641
          ( 186)    ( 221)    ( 290)    ( 273)    ( 284)
          P=0.284   P=0.078   P=0.001   P=0.013   P=0.141

(COEFFICIENT / (CASES) / SIGNIFICANCE)     (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)
```

DEM- 1 Class Size

DEM- 2 Number of Minority Students

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INF- 2 Amount of Discipline Problems

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INF-14 Amount of Student Movement

INF-15 Degree of Student Self-initiation

INF-16 Degree That Students Approach The Teacher

INF-17 Amount of Direct Teacher Presentation

INF-18 Amount of Assigned Homework

INF-19 Amount of Controlled Practice of New Material

INF-20 Degree of Monitoring of Seatwork

INF-21 Noise Level

INF-22 Amount of Wall Displays

INF-23 Room Temperature

Table 45

Correlation Between Engagement Rates and Outcome Measures

Grades 4-6

	Mean Engagement Rate in Specific Subject Area	Significance Level
Math Post Test	0.306	.0001
Language Arts Post Test	0.186	.0076
Social Studies Post Test	0.343	.0001
Math Residual Gain(1)	0.204	.0046
Language Arts Residual Gain(1)	0.027	0.7022
Social Studies Residual Gain(1)	0.042	0.5773

(1) Least squares residual gain using the math, language, and composit Iowa Tests of Basic Skills as the predictor. (Social Studies subtest was not available.)

Table 46

Correlations Among Attitude Subscales and Residual Scores and Mean Engagement Rates

Grades 4-6

Scale	Residual Score			Engagement Rate		
	Math	Language Arts	Social Studies	Math	Language Arts	Social Studies
Dependence/Independence	+.04	+.12	+.20	+.10	-.13	-.08
Behavior	-.16	-.03	-.03	-.12	-.13	-.25
Academic Futility	-.15	.00	-.07	-.10	-.08	-.26
Feedback	+.03	-.07	.00	+.08	+.06	-.07
Other Expectation	+.11	+.02	+.07	.00	+.09	+.23
Conscientiousness	+.05	.00	-.03	+.03	+.06	+.10
Internal Motivation	-.21	-.06	-.05	-.14	-.06	-.17
Self Concept	+.06	+.10	.00	+.05	+.10	+.16
Academic Futility (1)	-.23	-.12	-.22	-.15	-.08	-.23
Future Evaluation (1)	+.11	+.09	+.04	+.12	+.26	+.16
Teacher Push (1)	-.08	-.02	-.07	-.08	-.13	-.01
Present Evaluation (1)	+.09	+.11	+.00	+.10	+.09	-.03
Academic Norms (1)	+.00	+.05	-.04	+.03	+.00	+.17

(1) From Brookover's Instrument

Table 47

Zero Order and Part Correlations Adjusted for Entering Aptitude

	Des Moines Math Test	Mean Engagement Rate	Persistance	Entering Aptitude	ITBS Math Test
Des Moines Math Test		.32**	.30**	.42**	.67**
		(.16*)[1]	(.08)	(.15*)	
Mean Engagement Rate			.09	.17**	.31**
			(-.03)	(.03)	
Persistance				.40**	.36**
				(.28**)	
Entering Aptitude					.49**

---

1. Figures in parentheses represent part correlations adjusting for entering aptitude as measured by Iowa Test of Basic Skills.

** $p < .01$

* $p < .05$

Table 48

FULL MODEL

```
                                        GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE:  DES MOINES MATH TEST

SOURCE                  DF        SUM OF SQUARES          MEAN SQUARE         F VALUE          PR > F        R-SQUARE             C.V.

MODEL                    4          101.24712032          25.31178008           42.25          0.0001        0.477405      12245.7269

ERROR                  185          110.83106302           0.59908683                         STD DEV                     SDMATH MEAN

CORRECTED TOTAL        189          212.07818335                                           0.77400699                     -0.00632063


SOURCE                  DF           TYPE I SS      F VALUE       PR > F         DF           TYPE IV SS        F VALUE         PR > F

MEAN ENGAGEMENT          1         21.94108442        36.62       0.0001          1           3.05898609           5.11         0.0250
PERSISTENCE              1         15.43000707        25.76       0.0001          1           0.24843079           0.41         0.5204
ENTER ATTITUDE           1         17.72343756        29.58       0.0001          1           1.76384210           2.94         0.0879
ITBS  MATH               1         46.15259128        77.04       0.0001          1          46.15259128          77.04         0.0001


                                         T FOR H0:      PR > |T|              STD ERROR OF
PARAMETER                ESTIMATE      PARAMETER=0                              ESTIMATE

INTERCEPT             -3.04770053            -4.31        0.0001              0.70679810
MEAN ENGAGEMENT        0.65632740             2.26        0.0250              0.29045354
PERSISTENCE            0.01487564             0.64        0.5204              0.02310032
ENTER ATTITUDE         0.00930203             1.72        0.0879              0.00542117
 ITBS MATH             0.01943613             8.78        0.0001              0.00221440
                                                                 FULL MODEL
```

Table 49

REGRESSION OF RESIDUALS

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                                        GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESIDUAL MATH TEST

SOURCE                 DF      SUM OF SQUARES        MEAN SQUARE       F VALUE         PR > F       R-SQUARE           C.V.

MODEL                   3          5.73246900         1.91082300          3.21         0.0241       0.049179     99999.9999

ERROR                 186        110.83106302         0.59586593                      STD DEV                     RY14 MEAN

CORRECTED TOTAL       189        116.56353202                                      0.77192353                    0.00000000

SOURCE                 DF           TYPE I SS    F VALUE      PR > F        DF          TYPE IV SS    F VALUE      PR > F

RESIDUAL ENGAGEMENT     1          3.15097681       5.29      0.0226         1          3.05898609       5.13      0.0246
RESIDUAL PERSISTENCE    1          0.81765010       1.37      0.2429         1          0.24843079       0.42      0.5193
RESIDUAL ATTITUDE       1          1.76384210       2.96      0.0870         1          1.76384210       2.96      0.0870

                                       T FOR H0:     PR > |T|        STD ERROR OF
PARAMETER                ESTIMATE     PARAMETER=0                       ESTIMATE

INTERCEPT          -1.0622189E-15          -0.00       1.0000         0.05600122
RESIDUAL ENGAGEMENT    0.65632740           2.27       0.0246         0.28967170
RESIDUAL PERSISTENCE   0.01487564           0.65       0.5193         0.02303814
RESIDUAL ATTITUDE      0.00930203           1.72       0.0870         0.00540657
```

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APPENDICES

APPENDIX A

DOCE Observation Instrument
Parts I and II

I. INTRODUCTION

The DOCE system was designed to provide an objective description of the instructional activities in elementary classrooms. Information about the instructional activities in classrooms is necessary in order to answer basic questions of interest to the National Institute of Education (grant NIE-G-8a 0065) and to the school district: What is the amount and kind of instruction provided to students during an instructional day? What kinds of instructional activities result in high and low student engagement rates? Are there particular instructional strategies that work better for students of differing abilities? What is the relationship between the time of the day and student engagement rates? Are student engagement rates different in the different subject areas?

In order to answer the above questions, the DOCE system was designed to observe the teacher's activities and activities of four of her/his students across all subject areas for the entire day. The DOCE system consists of two computer scoreable sheets (DOCE Part I and DOCE Part II) which were designed to be used by classroom observers to gather data in four areas: one, contextual information about the classroom, such as the number of students; two, high inference data about such general classroom qualities as the room temperature, amount of discipline problems, emphasis on individualization, amount of seatwork, etc; three, the sequence of teaching activities used to carry out lesson plans; and four, the engagement rates of selected students at specific intervals of time.

In writing this manual, an attempt was made to describe the procedure for using the DOCE system in terms general enough to allow its application to any classroom observation situation, yet specific enough to anticipate potential problem areas relative to the project for which it was developed.

The following sections of this manual outline the general observational procedures you will follow, provide a detailed description of the DOCE system and give some examples of how to use the observational system. The actual instruments can be found in the appendix.

II. GENERAL PROCEDURES

Before Entering The Classroom

1. Be familiar with the procedure for using the observational forms.
2. Prepare the materials needed for the observation the day before. The observer's number, date and school can be coded on the observation forms ahead of time.
3. Have a pencil and clipboard ready.
4. Have a stop watch or a watch with a sweep second hand. (When you start the observations set your watch at 12:00).
5. Carry extra observation forms.
6. Know the location of the school and names of the principal, assistant principal, and teacher.
7. Dress appropriately.
8. Arrive at the school 10-15 minutes early and be sure to check in at the school office.

In The Classroom

1. Enter the classroom quietly.
2. Introduce yourself to the teacher or otherwise indicate your presence. (Do not offer any comments unless specifically asked by the teacher.)
3. Ask the teacher to identify the four target students you will be observing.
4. Select an unobtrusive place to sit yet such that all classroom activities may be observed and as many as possible overheard. You may change your location during the observation; however, walking around the room should be avoided.
5. Do not converse with the students. If a student should initiate a conversation, politely inform him/her that you cannot talk because you must do your work.

6. If you must leave the classroom, do so in a manner which does not disrupt the class.

Before Leaving the Classroom

1. Check to see that you have all your belongings with you.
2. Thank the teacher for his/her cooperation.
3. You may answer a teacher's questions about the purpose of the observations, but try to avoid discussion of the observation forms, especially the forms you completed during his/her class. The teachers are welcome to review the observational material at the end of the year; however, if they see them earlier they may modify their behavior to conform to what they believe we would consider desirable teaching behaviors (even though at this point in the study we have no idea what instructional techniques are effective for students of differing abilities).

III. DIRECTIONS FOR COMPLETING THE DOCE OBSERVATIONAL INSTRUMENTS

Part I of the DOCE

Part I of the Direct Observation of Classroom Events Instrument (DOCE) is designed to collect contextual information concerning the classroom environment (number of students, number of boys, number of minority students, etc.) plus high inference measures of numerous classroom qualities (e.g., discipline problems, room temperature, flexibility). One DOCE Part I instrument is completed for each teacher and is completed as follows:

A. Contextual Information

Teacher ID - consists of a five digit number which should be marked on the instrument in the standard fashion. For example, 12045 would be marked:

0	○	○	●	○	○
1	●	○	○	○	○
2	○	●	○	○	○
3	○	○	○	○	○
4	○	○	○	●	○
5	○	○	○	○	●
6	○	○	○	○	○
7	○	○	○	○	○
8	○	○	○	○	○
9	○	○	○	○	○

MO - Month - 2 digits (e.g., Jan = 01)

DY - Day --- 2 digits (e.g., April 12 = 12)

YR - Year -- 2 digits (e.g., 1980 = 80)

PG - Page number

Each observation sheet will have a unique sequential page number. The numbering will start with the first sheet completed (DOCE Part I) and terminate when all the day's observational sheets have been numbered. The numbering will start with "01" for each new observation day. The example below illustrates the numbering sequence for two days of observation. Note that the DOCE

Part I sheets always preceed the Part II sheets for a given teacher. Also observe that on Monday the class had two different teachers.

	Page Number	
Monday 9/21/80	1	DOCE Part I sheet for teacher A
	2	DOCE Part II sheets for teacher A
	3	
	4	
	5	
	6	
	7	DOCE Part I sheet for teacher B
	8	DOCE Part II sheets for teacher B
	9	
	10	
	11	
	12	
Tuesday 9/22/80	1	DOCE Part I sheet for teacher A
	2	DOCE Part II sheets for teacher A
	3	
	4	
	5	

Class size - the number of children in that classroom at the beginning of the observation

Boys ----- The number of boys in that classroom at the beginning of the observation

Min ------ The number of minority (non-white) students in class

# Min Boys - The number of minority (non-white) boys in class

Obs -------- Observer number that you have been assigned

Gd --------- Grade level of the majority of students in the class

School ----- The three digit school number

Teacher's sex - Male or female

Teacher's race - Code majority for white and minority for all other categories

Desk arrangement - Mark random, rows, or clusters according to the most typical arrangement during the observational period

B. High Inference Measures - To complete this section of the DOCE Part I observational instrument the observer is required to make judgments as to the magnitude of various classroom qualities. These qualities are listed below along with definitions of what a high or low score would represent. If it is not possible to make a judgment because of the nature of the day's activities, then leave the question blank (i.e., if no seatwork occurred during the day then leave the "degreee of monitoring of seatwork" question blank).

High	Variable	Low
1. Teacher has a tight control of all classroom tasks and personally directs each activity.	Amount of Teacher Directiveness	Teacher's control of events is loose. Students are frequently in charge of instruction or housekeeping activities.
2. Teacher frequently scolds students. The instructional activities are frequently interrupted because of student misbehavior. Classroom tends to be in a state of turmoil.	Amount of Discipline Problems	Teacher rarely is interrupted by misbehaving students. Students quickly obey teacher requests. Orderly classroom.
3. Teacher spends a lot of time praising students, complimenting students, and engaging in human relations activities such as hugging and touching. Teacher displays much warmth and student consideration.	Emphasis on Warmth/ Affect	Teacher is businesslike in approaching students. Teacher seldom praises students. Most activities are academic in nature with little emphasis on student emotional needs.
4. Teacher places much emphasis on "getting the job done." Frequently checks the students work. Most classroom activities are focused on academic tasks.	Task Emphasis	Little emphasis on completing assignments. Classroom activities are not centered around the completion of clearly defined tasks but rather tend to be general and quite changeable.

5.	Teacher's instructions are clear and students know exactly what and how to do the lesson. Students tend to ask few procedural questions and understand the lesson.	Clarity of Presentation	Students seem generally confused about assignments and how to do them. Students typically ask many questions regarding the material the teacher just covered.
6.	Students are working on separate tasks most of the day.	Degree in Individualization	All students are working on the same task or assignment.
7.	Students are allowed to choose the activities they want to do. Teacher frequently asks students what they would like to do and/or how they would like to do it.	Amount of Student Choice	Teacher makes all the decisions when alternative courses of action are present. Rarely asks students for their input regarding their choice.
8.	Transition between one activity and another is quiet, smooth and efficient.	Smoothness of Shifts Between Activities	Transition between activities is marked by prolonged noise and confusion. A good deal of time is consumed during the transition process.
9.	Teacher holds students responsible for their classroom behavior and academic work. Homework is frequently checked. Students know the rules and are expected to obey them.	Degree Which Students Are Held Responsible	Students are not usually held responsible if they misbehave or fail to turn in an assignment. Homework is infrequently assigned and checked. Seatwork is not usually monitored.
10.	Students frequently volunteer to help the teacher with housecleaning tasks. They rarely complain about assignments or work the teacher assigns.	Amount of Student Cooperation	Students rarely volunteer to help the teacher. Students tend to pay little attention to teacher requests for assistance. Students frequently complain about assignments and classroom work.

11. The teacher frequently changes the daily plans to accomodate new circumstances. Daily lesson plans are rarely followed.	Amount of Flexibility	Lesson plans are not often changed. One day is pretty much like the next. Students are use to a standard routine that rarely varies.
12. All students are engaged working on tasks defined by the teacher as being appropriate.	Degree to Which Class Was Kept On Task	A major portion of the class is not usually engaged in teacher sanctioned activities.
13. Teacher frequently checks for student understanding of how to do a particular task. The teacher often goes around the room making sure all the students understand what they are doing.	Amount of Process Evaluation	The teacher rarely checks for student understanding. He/she most often assumes that the students understand. After presenting a lesson the teacher is not readily available to help students with questions.
14. Students frequently get up and move about the classroom.	Amount of Student Movement	Students are not free to move about and spend most of their time in an assigned seat.
15. Students frequently start new projects on their own. They initiate many activities without any teacher help or encouragement.	Degree of Student Self-initiation	Students generally follow the teacher's directions as to what to do. They rarely are responsible for initiating classroom activities.
16. Students usually approach the teacher for help.	Degree That Students Approach The Teacher	Teacher generally seeks out students who he/she determines will probably need assistance rather than waiting for those students to ask questions.
17. Teacher presents new information mainly through lectures or question/answer sessions.	Amount of Direct Teacher Presentation	Teacher presents new information in an indirect fashion through worksheets, workbooks, small groups, conferences, etc.

18. Homework is assigned on a daily basis.	Amount of Assigned Homework	Homework is rarely assigned.
19. The teacher has the students practice skills just taught and the teacher closely monitors that practice.	Amount of Controlled Practice of New Material	The teacher rarely has the students practice skills just taught.
20. When the students are working at their seats, the teacher actively monitors their work. This is usually done by the teacher walking around the room answering and asking questions.	Degree of Monitoring of Seatwork	The teacher leaves the students alone to work on their seatwork. There is little effort to monitor the student's progress.
21. Difficult for the student to hear the teacher at times.	Noise Level	Extremely quiet. Students speak only when given permission by the teacher.
22. Posters and other materials evident.	Amount of Wall Displays	Very little visual stimulation available.
23. Above 80° F.	Room Temperature	Below 65° F.
24. Other A-D not defined.		

Part II of the DOCE

Part II of the DOCE observation instrument is designed to provide an objective description of the instructional activities and resultant student behaviors in elementary school classrooms. Part II employs both a "time sampling system" which requires an observer to note the occurrence of specific student activities every three minutes, and an "every occurrence system" where each major change in teacher behavior is coded.

The occurrence section which focuses on the teacher is divided into three parts (teacher activity, subject area, and number of groups with whom the teacher is working), while the time sampling section is grouped into five areas (what the student is expected to be doing, what the student is actually doing, the subject area, how many people are working with the student and what the structure of the task is).

The system functions as follows:

> The observer watches the teacher and records every major change in the teacher's instructional pattern as indicated on the observation sheet. With every change, the coder also indicates the subject area and the number of groups with which the teacher is currently working. Every three minutes the coders record the behavior of four previously identified students in each of the five defined categories (task expectation, response, subject, groups, and structure). This process continues throughout the entire observational period.

The objective of Part II of the observation system is to record data in such a manner as to be able to ultimately link teacher activities to resultant student behavior. That is, we are interested in finding out what sequence of teacher activities results in specific types of pupil behavior (e.g., if a fourth grade teacher lectures for 15 minutes how much of that time are the identified students actually paying attention). The definition of the categories follows (see Appendix A and B for a copy of the instrument):

I. Teacher Occurrence Section

  A. Teacher Behavior

    1. Change - marked each time this section is entered from the student section. This code has no meaning other than to indicate the sequencing of the observer's marks.
    2. Absent - marked when the teacher is out of the room for more than 30 seconds.
    3. Boardwork - marked when the instructional activities involve sending students to the board for practice work under direct teacher supervision.
    4. Checking - marked when the teacher is actively checking the student's work with the student such as reading off the answers.
    5. Class Discussion - marked when the teacher is discussing a particular topic with the students. This must include active student responses and be more than a question/answer session, with student initiated questions and/or comments.
    6. Class Control - marked when the teacher is engaging in activities whose purpose is to control the behavior of individual students or the class as a whole (discipline). This category should not be marked for minor discipline activities of duration of ten seconds or less.

7. Gaming - marked when the students with the teacher are engaged in playing games or game like activities. Examples would include such activities as: spelling bees, drop the handkerchief, baseball.
8. Giving Instructions - marked when the teacher is giving directions concerning the procedure for completion of a given task (e.g., how to complete a form, how to head a paper, how to board the bus). This category does not include instructional activities such as the teacher explaining how to add or how to work a given problem. Please note that the title of the category is giving instructions not giving instruction.
9. Group/Active - marked when the students with the teacher are actively engaged in group activities that are not gaming in nature. Typical examples would be group singing, calisthenics, group artwork and fieldtrips.
10. Inactive - marked when the teacher is not interacting with the students or monitoring their work. The most typical example would be where the teacher is sitting at his/her desk correcting papers, working on lesson plans, or putting up displays.
11. Housekeeping - coded when the students and the teacher are engaged in maintenance type activities such as cleaning up, collecting lunch money, and taking attendance. This category would typically be coded at the beginning of each day. It would not usually be marked when students simply change subject areas (see Transition).
12. Lecture - marked when the teacher is engaged in direct, uninterrupted instruction or explanation. Typically coded when the teacher is presenting a lesson or explaining how to work problems. Student questions and interruptions are usually limited.
13. Lab Work - coded when students with the teacher are engaged in work that involves experimentation and/or manipulation of equipment or other materials. Examples would include science labs, manipulation of blocks or clay, individual students finger painting, and working with rulers.
14. Media - when the students with the teacher are watching/listening to a film, tape, slides, T.V., record or other form of media presentation
15. Interruption - coded when the teacher is interrupted by an event or person from outside the classroom. For example, when the principal makes an announcement over the public address system.
16. Question/Answer - marked when the teacher is asking students questions and responding to their answers. This activity will usually occur within an instructional framework in which the teacher uses the question/answer format as a teaching device. Note that the answer may be in the form of working out a problem.
17. Read to Class - marked when the teacher is reading a book, magazine or other text to the students for extended periods of time.
18. Recess - coded when students are given a break.

19. Seatwork-GP - coded when the students with the teacher are working on a task in groups. Two or three students working together on a math worksheet at their desks would be a typical example.
20. Seatwork-Ind - coded when students are individually working at their desks with little assistance from other students.
21. Testing - marked when the teacher is administering a test.
22. Transition - coded when the teacher is changing from one activity to another. Transition is signaled by teacher command or other teacher signals that say the activity is now to change (e.g., change from seatwork to a small reading group). Examples of transition time instructions could be when the teacher says, "Put your math materials away and get ready for reading" or "Get out your science books." Transition is the time between activities when the students are engaged in (1) putting a completed activity away and (2) getting materials for a new activity. Transition is ended when the teacher begins a new activity.
23. Other A - undefined.
24. Other B - undefined.

B. Subject Area

1. Math - coded when the teacher is engaged in activities related to mathematics (e.g., giving instruction in mathematics, figuring solutions to problems, using mathematics-related materials, etc.).
2. Science - coded when the teacher is engaged in activities related to science (e.g., giving instructions in science, working on science project, performing experiments).
3. Social Science - coded when the teacher is engaged in activities related to social studies (e.g., giving instructions in social studies, making and/or coloring a map, watching a historical film, researching a report for social studies in the library, etc.).
4. Health - coded when the teacher is engaged in activities related to health; especially the health of the human body.
5. Reading - coded when the teacher is engaged in activities related to reading but not language arts (e.g., reading aloud, having the students read silently, viewing educational television programs aimed at developing reading skills).
6. Language Arts - coded when the teacher is engaged in activities related to language arts (e.g., grammar, writing, spelling, oral work, listening, sentence construction, composition, literature).
7. P.E. - coded when the teacher is engaged in activities related to physical education. This must be a planned and supervised activity. Free play time would not be considered physical education.
8. Music - coded when the teacher is engaged in activities related to music instruction (e.g., playing piano or records, singing, rhythm development).
9. Art - coded when the teacher is engaged in activities related to art (e.g., drawing, painting, using construction paper).

10. Non-Academic - coded when the teacher is engaged in non-academic activities (e.g., collecting lunch money, taking attendance, supervising bathroom breaks.
11. Other A - undefined.
12. Other B - undefined.

C. Number of Groups - simply coded according to how many unique groups are in the classroom. The groups should probably maintain their integrity for periods of five minutes or more.

II. Student Time Sampling Section

A. Student Task Expectation - a single mark (with the exception of a change indication) should be coded in this section which best represents what the teacher expects each of the four students to be doing. The categories of expectations are defined below:

1. Change - marked each time this section is entered from the teacher section. This code has no meaning other than to indicate the sequencing of the observer's marks.
2. Music - coded when the student is expected to be engaged in a music related activity such as singing, playing an instrument, skipping to music, etc.
3. Phy. Move - coded when the student is expected to be engaged in activities that require some physical movement (e.g., calisthenics, jumping rope, shooting baskets, working with clay, painting). This does not include activities that are related to music nor physical movement activities such as working at the board, writing, transition activities, group activities, speaking, or group activities such as baseball (coded as Gp activities).
4. Transition - coded when the student is expected to be engaged in transition activities associated with shifting from one activity to another. This would include putting away materials, getting out materials, moving from one area of the room to another, etc.
5. Listening - coded when the student is expected to be listening to either the teacher or another individual.
6. Speaking - coded when the student is expected to be speaking.
7. Writing - coded when the student is expected to be engaged in writing activities in any subject area. This may include working math problems as well as working on a language arts composition paper.
8. Reading - coded when the student is expected to be reading.
9. Boardwork - coded when the student is expected to be working at the chalkboard or bulletin board.
10. Gp Activities - coded when the student is expected to be working with other students in group activities that require cooperation among participants (e.g., group games such as baseball, tag, drop the handkerchief).
11. Inactive - coded when the student is expected to be inactive while waiting for an event to occur. Generally this category is coded if the student is expected to be waiting in line or sitting quietly at his seat.
12. Other A - undefined.

B. Student Response - a single mark should be coded in this section that best represents the student's behavior at the three minute interval. The categories of responses are defined below:

1. On Task - coded when the student is working on a teacher specified task.
2. Waiting - coded when the student is waiting for an event to occur (waiting for the teacher to answer a question, standing in line for equipment, etc.).
3. Misbehavior - coded when the student is causing a behavioral problem.
4. Inattentive - coded when the student is not paying attention to the expected work (e.g., starring around the room, playing with equipment, sleeping or day dreaming).
5. Absent - coded when the targeted student is not physically present in the room.
6. Other A - undefined.

C. Subject - same as before.

D. Structure - this section is divided into two parts, thus, two marks are possible. One mark must be placed in either the Self or Other-Paced categories and a second mark may be placed in the Adult With, Teacher With or Other A category. These categories are defined below:

1. Self-paced - coded when the student is working on an activity in which he/she controls the pace (e.g., working through a worksheet on his/her own).
2. Other-paced - coded when the student is working on an activity in which someone else controls the speed with which he/she can work (e.g., a teacher assigning a problem then waiting for everyone in the class to finish before moving to a new problem).
3. Adult With - coded when an adult other than the teacher is actively supervising the student's work. That is, the adult was available to answer questions and could observe the student's activities. It would not be coded if the adult was involved with another group and the target student was working on his own or with a relatively unsupervised group.
4. Teacher With - coded when the teacher is actively supervising the student's work.
5. Other A - undefined.

E. Group Size - coded simply as the number of students with which the target student is working. If he/she is working alone then "one" would be coded.

F. Stop - coded when the observer stops recording (e.g., for lunch, restroom breaks). For every three minute segment that is lost, the stop code is marked.

IV. POTENTIAL PROBLEM AREAS

The most important component of classroom observation is, of course, the observer. With any observation instrument there are inherent limitations to its use, and unanticipated difficulties in using the instrument will inevitably arise. The extent to which these drawbacks can be overcome will depend on the discretion, experience, and resourcefulness of the observer. A few examples:

1. Identification of the students to be observed - it will be necessary for the observer to make this identification in a manner which injects as little bias as possible into the observation. The method to be employed by observers will be simply to ask the classroom teacher to identify the four target students. If one of the students is absent then choose the designated alternate student. If no student in a given category is available, then choose a student at random to code.
2. The student leaves the classroom or group of students under observation - If the whole class moves to a different area or a different teacher takes over, then the observer simply continues to code as normal. If, however, the student leaves the classroom and it is impossible for the observer to see what he is doing, then the "absent" category should be coded and the remaining student categories for that student left blank. The "absent" category should be coded as long as the student is out of view.
3. The students spread out to various corners of the classroom to make simultaneous observation difficult - Code the students you can see and mark the others as absent. Note this occurrence under the comments section.

4. The students are divided into several groups each with an adult serving as a teacher - Continue to code the teacher's activities and ignore the other adults. In the student section, code "Adult With" to indicate the teacher was not the only adult present.

5. Lunch break - Continue to code until the students actually physically go to the cafeteria then use the stop category to indicate a break in coding. The stop category should be marked for each three minute segment the students are at lunch. For example, if the lunch period lasts 30 minutes then 10 "stop" codes (ten, three minutes segments) should have been marked. Remember that you should be able to account for some activity (even if only marked via a stop category) during the entire school day for students.

6. Observer leaves the classroom - Obviously there will be times when you must leave the room. During that time code the "stop" category as explained above. Try to hold the interruptions to a minimum (smoke or coffee breaks are not allowed).

7. Running out of space for teacher coding - For teachers who frequently change activities you might run out of coding columns for their behavior. If you do, simply start another sheet but mark the student section of the new sheet where you left off on the student section of the old form. That is, if you were last on the :24 minute interval on the student section of the old coding sheet your first mark on the student side of the new form should be under the :27 minute column. The :03 to :24 columns of the new form should be left blank.

8. The coding form can't be used - Although the DOCE observational system was designed for general use, there are probably a few

occasions where it will not work. If you run across such a situation, discard the forms and instead keep a written diary describing what is happening. If you can, take notes regarding the engagement rates of the four identified students. When you finish that day's observation, give us a call so we can make needed adjustments.

V. EXAMPLE

The following example illustrates how a typical classroom might be coded. The left side of the sheet describes the teacher's activities and subsequent codes while the right side covers the coding of the four students.

TIME TEACHER CODING

00:03 The teacher started the class off by reading the day's announcements (coded under Teacher as "housekeeping;" Subject, non-academic; and Number of Groups, one group) then asked the students who wanted lunch tickets (still "housekeeping," so no new mark). After collecting the lunch money the teacher told the students to get out their math books (coded "transition" under Teacher; math under Subject, and one group, under Number of Groups).

03:06 After the students had settled down the teacher started to explain how to multiply fractions ("change" was coded under Teacher because the observer had to change from the student to teacher scale, the "lecture" category under Teacher is also marked; math under Subject and one group under number of groups).

06:09 Teacher continued to explain how to multiply fractions (no new mark under the teacher section).

09:12 Teacher continued to explain how to multiply fractions (no new mark under the teacher section).

TIME STUDENT CODING

:03 The observer would mark "change" at the 3 minute interval because she/he is entering the student section from the teacher section then code each of the four students. At this point all four students were expected to be getting out their math books so the student task expectation was coded "transition," the subject area coded as "math," the structure was coded as "other paced," the "teacher with" category was marked, and the group size was coded as "Four/up" since each student was part of the total group which consisted of the entire class. (Note, the student response section is not marked. This section would reflect each students behavior at the time of observation.)

:06 The observer marked "change" at the 6 minute interval then coded each of the four students:

Task expectation - "Listening"
Student response - varies
Subject - "Math"
Structure - "Other paced" and "Teacher with"
Group Size - "Four/up"

:09 The "change" category was not coded because the observer did not leave the student section. Each student was coded as above.

:12 The observer coded the four students as above ("change" was not marked).

TIME	TEACHER CODING	TIME	STUDENT CODING
12:15	Teacher continued to explain how to multiply fractions (no new mark under the teacher section). At :13 the teacher wrote a sample problem on the board and asked the students to work that one problem at their desks ("change" was coded as was "Seatwork-Ind."). After most of the students had finished the teacher worked the problem at the board and assigned the students another problem to work at their desks. (The teacher's explanation was not coded because it lasted only a brief time.) This same activity went on for the next 20 minutes (to 0:35).	:15	The observer coded the four students as follows and marked the "change" code: Task expectation - "Writing" Student response - varies Subject - "Math" Structure - "Other paced" and "Teacher with" Group size - "Four/up"
15:18		:18	The observed coded the four students as above (no "change" code).
18:21		:21	The observer coded the four students as above (no "change" code).
21:24		:24	The observer coded the four students as above (no "change" code).
24:27		:27	The observer coded the four students as above (no "change" code).
27:30		:30	The observer coded the four students as above (no "change" code).

TIME	TEACHER CODING	TIME	STUDENT CODING
30:33		:33	The observer coded the four students as above (no "change" code.)
33:36	The observer started a new form because the last student column had been used. At 0:35 the teacher assigned the class a series of problems to be completed at their desks (note, no coding change necessary for the teacher since there is no change in teacher behavior), walked around	:36	The observer continued to code the student codes as: Task expectation - "Writing" Student response - varies Subject - "Math" Structure - "Self paced" and "Teacher with" Group size - "Four/up"
36:39	the room for the next few moments checking their work, then sat down at her/his desk and started to check papers (0:37) ("change" coded along with "inactive;" subject, math; and one group).	:39	The observer coded "change" and the following student codes: Task expectation - "Writing" Student response - varies Subject - "Math" Structure - "Self paced" only Group size - "Four/up"
39:42	No change in teacher behavior, therefore, no additional codes.	:42	Observer coded as before but did not mark "change."
42:45	No change in teacher behavior until 0:43 when the teacher dismissed the class for lunch ("change" coded along	:45	Observer coded "change" and "stop."
45:48	with "Other A," "Non-Acad," and "One group").	:48	"Stop" coded.
48:51		:51	"Stop" coded.

TIME	TEACHER CODING	TIME	STUDENT CODING
51:54		:54	"Stop" coded.
54:57		:57	"Stop" coded.
57:60	At 0:58 the class returned from lunch and the teacher took roll before dismissing class for the day ("change" coded plus "housekeeping"). No further coding occurred.		

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DOCE OBSERVATION INSTRUMENT
PART II

A-24

TEACHER

Change	C	C	●	●	C	C	C	C	C	C	C
Absent	A	A	A	A	A	A	A	A	A	A	A
Boardwork	B	B	B	B	B	B	B	B	B	B	B
Checking	C	C	C	C	C	C	C	C	C	C	C
Class Discussion	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD
Class Control	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
Gaming	G	G	G	G	G	G	G	G	G	G	G
Giving Instruct	GI	GI	GI	GI	GI	GI	GI	GI	GI	GI	GI
Group/Active	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA
Inactive	I	I	I	I	I	I	I	I	I	I	I
Housekeeping	●	H	H	H	H	H	H	H	H	H	H
Lecture	L	L	●	L	L	L	L	L	L	L	L
Lab Work	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb
Media	M	M	M	M	M	M	M	M	M	M	M
Interruption	I	I	I	I	I	I	I	I	I	I	I
Question/Answer	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Read to Class	R	R	R	R	R	R	R	R	R	R	R
Recess	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc
Seatwork-Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp
Seatwork Ind	I	I	I	●	I	I	I	I	I	I	I
Testing	T	T	T	T	T	T	T	T	T	T	T
Transition	Tr	●	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr
Other A	A	A	A	A	A	A	A	A	A	A	A
Other B	B	B	B	B	B	B	B	B	B	B	B

SUBJECT

Math	M	●	●	●	M	M	M	M	M	M	M
Science	S	S	S	S	S	S	S	S	S	S	S
Social Science	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
Health	H	H	H	H	H	H	H	H	H	H	H
Reading	R	R	R	R	R	R	R	R	R	R	R
Language Arts	L	L	L	L	L	L	L	L	L	L	L
P.E.	P	P	P	P	P	P	P	P	P	P	P
Music	M	M	M	M	M	M	M	M	M	M	M
Art	A	A	A	A	A	A	A	A	A	A	A
Non Acad	●	N	N	N	N	N	N	N	N	N	N
Other A	A	A	A	A	A	A	A	A	A	A	A
Other B	B	B	B	B	B	B	B	B	B	B	B

NUMBER OF GROUPS

One Group	●	●	●	●	1	1	1	1	1	1	1
Two Groups	2	2	2	2	2	2	2	2	2	2	2
Three Groups	3	3	3	3	3	3	3	3	3	3	3
Four up	4	4	4	4	4	4	4	4	4	4	4

STUDENT

STUDENT TASK EXPECTATION

	:03 :33	:06 :36	:09 :39	:12 :42	:15 :45	:18 :48	:21 :51	:24 :54	:27 :57	:30 :60
Change	●	●	C	C	●	C	C	C	C	C
Music	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M
Phy. Move	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P
Transition	● ● ● ●	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Listening	L L L L	● ● ● ●	● ● ● ●	● ● ● ●	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L
Speaking	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S
Writing	W W W W	W W W W	W W W W	W W W W	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●
Reading	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
Boardwork	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B
GP Activi	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G
Inactive	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A

STUDENT RESPONSE

On Task	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Waiting	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W
Misbehav	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M
Inattentive	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I
Absent	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A

SUBJECT

Math	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●
Science	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S
Social Stu	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS
Health	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H
Reading	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
Lang. Art	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L
P.E	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P
Music	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M
Art	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
Non Acad	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A

STRUCTURE

Self pace	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S
Other Pace	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●
Adult Wit	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
Teacher W	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A

GROUP SIZE

1 Person	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1
2 People	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2
3 People	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3
Four up	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●
Stop	S	S	S	S	S	S	S	S	S	S

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STUDENT 1

●	●	●	●	●	0
1	1	1	1	1	●
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

STUDENT 2

●	●	●	●	●	0
1	1	1	1	1	1
2	2	2	2	2	●
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

STUDENT 3

●	●	●	●	●	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	●
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

STUDENT 4

●	●	●	●	●	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	●
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

OBS

●
1
2
3
4
5
6
7
8
9

PAGE

●	0
1	●
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

TEACHER

●	●	0
1	1	●
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

SCHOOL

●	●	0
1	1	●
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

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DOCE OBSERVATION INSTRUMENT
PART II

TEACHER

Change	●	●	●	C	C	C	C	C	C	C	C
Absent	A	A	A	A	A	A	A	A	A	A	A
Boardwork	B	B	B	B	B	B	B	B	B	B	B
Checking	C	C	C	C	C	C	C	C	C	C	C
Class Discussion	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD	CD
Class Control	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC	CC
Gaming	G	G	G	G	G	G	G	G	G	G	G
Giving Instruct	GI	GI	GI	GI	GI	GI	GI	GI	GI	GI	GI
Group Active	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA	GA
Inactive	●	I	I	I	I	I	I	I	I	I	I
Housekeeping	H	H	●	H	H	H	H	H	H	H	H
Lecture	L	L	L	L	L	L	L	L	L	L	L
Lab Work	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb	Lb
Media	M	M	M	M	M	M	M	M	M	M	M
Interruption	I	I	I	I	I	I	I	I	I	I	I
Question/Answer	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Read to Class	R	R	R	R	R	R	R	R	R	R	R
Recess	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc	Rc
Seatwork Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp	Gp
Seatwork Ind	I	I	I	I	I	I	I	I	I	I	I
Testing	T	T	T	T	T	T	T	T	T	T	T
Transition	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr
Other A	A	●	A	A	A	A	A	A	A	A	A
Other B	B	B	B	B	B	B	B	B	B	B	B

SUBJECT

Math	●	M	M	M	M	M	M	M	M	M	M
Science	S	S	S	S	S	S	S	S	S	S	S
Social Science	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
Health	H	H	H	H	H	H	H	H	H	H	H
Reading	R	R	R	R	R	R	R	R	R	R	R
Language Arts	L	L	L	L	L	L	L	L	L	L	L
P.E.	P	P	P	P	P	P	P	P	P	P	P
Music	M	M	M	M	M	M	M	M	M	M	M
Art	A	A	A	A	A	A	A	A	A	A	A
Non Acad	N	●	●	N	N	N	N	N	N	N	N
Other A	A	A	A	A	A	A	A	A	A	A	A
Other B	B	B	B	B	B	B	B	B	B	B	B

NUMBER OF GROUPS

One Group	●	●	●	1	1	1	1	1	1	1	1
Two Groups	2	2	2	2	2	2	2	2	2	2	2
Three Groups	3	3	3	3	3	3	3	3	3	3	3
Four up	4	4	4	4	4	4	4	4	4	4	4

STUDENT

	:03 :33	:06 :36	:09 :39	:12 :42	:15 :45	:18 :48	:21 :51	:24 :54	:27 :57	:30 :60
STUDENT TASK EXPECTATION										
Change	C	C	●	C	●	C	C	C	C	C
Music	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M
Phy. Move	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P
Transition	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Listening	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L
Speaking	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S
Writing	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W
Reading	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
Boardwork	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B	B B B B
GP Activi	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G	G G G G
Inactive	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
STUDENT RESPONSE										
On Task	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Waiting	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W	W W W W
Misbehav	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M
Inattentive	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I	I I I I
Absent	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab	Ab Ab Ab Ab
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
SUBJECT										
Math	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M
Science	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S
Social Stu	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS	SS SS SS SS
Health	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H	H H H H
Reading	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
Lang. Art	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L	L L L L
P.E.	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P
Music	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M	M M M M
Art	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
Non Acad.	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
STRUCTURE										
Self pace	S S S S	S S S S	● ● ● ●	● ● ● ●	S S S S	S S S S	S S S S	S S S S	S S S S	S S S S
Other Pace	O O O O	O O O O	O O O O	O O O O	O O O O	O O O O	O O O O	O O O O	O O O O	O O O O
Adult Wit	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
Teacher W	● ● ● ●	● ● ● ●	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
Other A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A	A A A A
GROUP SIZE										
1 Person	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1
2 People	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2
3 People	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3
Four up	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	4 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4
Stop	S	S	S	S	●	●	●	●	●	S

STUDENT 1

●	●	●	●	●	0
1	1	1	1	1	●
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

STUDENT 2

●	●	●	●	●	0
1	1	1	1	1	1
2	2	2	2	2	●
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

STUDENT 3

●	●	●	●	●	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	●
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

STUDENT 4

●	●	●	●	●	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	●
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

OBS

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PAGE

●	0
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3	3
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7	7
8	8
9	9

TEACHER

●	●	0
1	1	●
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

SCHOOL

●	●	0
1	1	●
2	2	2
3	3	3
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5	5	5
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7	7	7
8	8	8
9	9	9

DOCE OBSERVATION INSTRUMENT

Part I

TEACHER I.D.	MO.	DAY	YR.	PAGE	CLASS SIZE	# BOYS	# MIN.	# MIN. BOYS	OB	GRADE	SCHOOL
⓪ ⓪ ⓪ ⓪ ⓪	⓪ ⓪	⓪ ⓪	⓪ ⓪	⓪ ⓪	⓪ ⓪	⓪ ⓪	⓪ ⓪	⓪ ⓪	⓪	Ⓚ	⓪ ⓪ ⓪
① ① ① ① ①	① ①	① ①	① ①	① ①	① ①	① ①	① ①	① ①	①	①	① ① ①
② ② ② ② ②	② ②	② ②	② ②	② ②	② ②	② ②	② ②	② ②	②	②	② ② ②
③ ③ ③ ③ ③	③ ③	③ ③	③ ③	③ ③	③ ③	③ ③	③ ③	③ ③	③	③	③ ③ ③
④ ④ ④ ④ ④	④ ④	④ ④	④ ④	④ ④	④ ④	④ ④	④ ④	④ ④	④	④	④ ④ ④
⑤ ⑤ ⑤ ⑤ ⑤	⑤ ⑤	⑤ ⑤	⑤ ⑤	⑤ ⑤	⑤ ⑤	⑤ ⑤	⑤ ⑤	⑤ ⑤	⑤	⑤	⑤ ⑤ ⑤
⑥ ⑥ ⑥ ⑥ ⑥	⑥ ⑥	⑥ ⑥	⑥ ⑥	⑥ ⑥	⑥ ⑥	⑥ ⑥	⑥ ⑥	⑥ ⑥	⑥	⑥	⑥ ⑥ ⑥
⑦ ⑦ ⑦ ⑦ ⑦	⑦ ⑦	⑦ ⑦	⑦ ⑦	⑦ ⑦	⑦ ⑦	⑦ ⑦	⑦ ⑦	⑦ ⑦	⑦	⑦	⑦ ⑦ ⑦
⑧ ⑧ ⑧ ⑧ ⑧	⑧ ⑧	⑧ ⑧	⑧ ⑧	⑧ ⑧	⑧ ⑧	⑧ ⑧	⑧ ⑧	⑧ ⑧	⑧	⑧	⑧ ⑧ ⑧
⑨ ⑨ ⑨ ⑨ ⑨	⑨ ⑨	⑨ ⑨	⑨ ⑨	⑨ ⑨	⑨ ⑨	⑨ ⑨	⑨ ⑨	⑨ ⑨	⑨	⑨	⑨ ⑨ ⑨

Teacher's Sex

Male ○

Female ○

Teacher's Race

Majority ○

Minority ○

Desk Arrangement:

Random ○

Rows ○

Clusters ○

High Inference Measures	High		Average		Low
1. Amount of Teacher Directiveness	○	○	○	○	○
2. Amount of Discipline Problems	○	○	○	○	○
3. Emphasis on Warmth/Affect	○	○	○	○	○
4. Task Emphasis	○	○	○	○	○
5. Clarity of Presentations	○	○	○	○	○
6. Degree of Individualization	○	○	○	○	○
7. Amount of Student Choice	○	○	○	○	○
8. Smoothness of Shifts Between Activities	○	○	○	○	○
9. Degree Which Students are Held Responsible	○	○	○	○	○
10. Amount of Student Cooperation	○	○	○	○	○
11. Amount of Flexibility	○	○	○	○	○
12. Degree to Which Class was Kept on Task	○	○	○	○	○
13. Amount of Process Evaluation	○	○	○	○	○
14. Amount of Student Movement	○	○	○	○	○
15. Degree of Student Self-initiation	○	○	○	○	○
16. Degree that Students Approach Teacher	○	○	○	○	○
17. Amount of Direct Teacher Presentation	○	○	○	○	○
18. Amount of Assigned Homework	○	○	○	○	○
19. Amount of Controlled Practice of New Material	○	○	○	○	○
20. Degree of Monitoring of Seatwork	○	○	○	○	○
21. Noise Level	○	○	○	○	○
22. Amount of Wall Displays	○	○	○	○	○
23. Room Temperature	○	○	○	○	○
24. Other A	○	○	○	○	○
25. Other B	○	○	○	○	○
26. Other C	○	○	○	○	○
27. Other D	○	○	○	○	○

Teacher's Name ____________

Student One ____________

Student Two ____________

Student Three ____________

Student Four ____________

General Comments:

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APPENDIX B

Student Attitude Inventory

STUDENT ATTITUDE INVENTORY

Name____________________________

School__________________________

Teacher's Name___________________

Grade___________________________

DIRECTIONS:

Read each statement and decide if you usually agree or disagree with that statement. If you agree, circle the letter T for True next to the question. If you disagree, circle the letter F for False next to the question. Please answer every question. If you have a question, ask your teacher for help.

T F 1. I can do school work better than most of my friends.

T F 2. I work harder on assignments I know will be checked.

T F 3. I need to be reminded often to get my school assignments done.

T F 4. My parents expect me to do well in school.

T F 5. I will not have much of a chance to do what I want in life.

T F 6. I often get into trouble.

T F 7. I always like to choose what to work on.

T F 8. I do not like to check my homework or assignments.

T F 9. I can do school work better than most of my classmates.

T F 10. I want to get good grades just to show my friends.

T F 11. I sometimes forget to do my school assignments.

T F 12. My teachers expect me to do well in school.

T F 13. I will not do well in school even though I try hard.

T F 14. Teachers often yell at me.

T F 15. I like to do assignments in my own way.

T F 16. I like to check my work to see which problems I missed.

T F 17. I think I could finish college.

T F 18. I work hard on assignments even if I know the teacher is not going to collect the papers.

T F 19. I can always remember what I am told to do.

T F 20. My friends expect me to do well in school.

T F 21. To get good grades you need to be lucky.

T F 22. The teacher often gets mad at me.

T F 23. I like to choose what to do.

T F 24. I like to know what problems I missed on an assignment.

T F 25. When I finish high school I will be one of the best students.

T F 26. I work hard on my assignments because it makes me feel good when I do well.

T F 27. I usually finish the easy assignments but not the hard ones.

T F 28. My teacher thinks I can do well in school.

T F 29. I can do well in school if I work hard.

T F 30. Sometimes I get into fights at school.

T F 31. I like it best when the teacher tells us what to do.

T F 32. I like to have the teacher check my assignments.

T F 33. I can be a good student this year.

T F 34. I work harder when the teacher is watching me.

T F 35. I usually finish my school assignments.

T F 36. My teacher would say that I would do well in high school.

T F 37. It is not possible for me to do well in school.

T F 38. Sometimes I have to stay after school because I got into trouble.

T F 39. I like to make up my own assignments.

T F 40. I like to have someone at home check my work before I bring it to school.

T F 41. I think my schoolwork is pretty good.

T F 42. I do not work very hard when I know the teacher is not looking.

T F 43. I sometimes lose my books and papers.

T F 44. Teachers at this school expect me to do well in school.

T F 45. I like to check my own work.

T F 46. It is no use to work hard in school because I will get the same grades anyway.

T F 47. Sometimes I don't get to do what I want because I got into trouble.

T F 48. Practicing new problems with my teacher is a waste of time.

T F 49. If I went to college I would be one of the better students.

T F 50. If I find out why I made a mistake I usually don't make that same mistake again.

T F 51. I like to figure out how to work new problems without my teacher's help.

T F 52. I sometimes don't get my school assignments done on time.

T F 53. I like to have other students help me with my assignments.

APPENDIX C

Brookover's Instrument

TIME ON TASK

School Climate Inventory
Student Questionnnaire

DIRECTIONS: We are trying to learn more about students and their work in schools. We would, therefore, like for you to respond to the following questions. This is not a test of any sort and will not affect your work in school. Your teacher and your principal will not see your answers. There are no right or wrong answers: we simply want you to tell us your answer to each question.

NAME____

PLEASE ANSWER THE FOLLOWING QUESTIONS BY CIRCLING THE NUMBER ON THE RIGHT OF YOUR BEST ANSWER TO THE QUESTION. PICK ONLY ONE ANSWER FOR EACH QUESTION!!!

1. How old were you on your last birthday?

9 years old	1
10 years old	2
11 years old	3
12 years old	4
13 years old	5

2. Are you a boy or girl?

boy	1
girl	2

3. What grade are you in?

3rd grade	1
4th grade	2
5th grade	3
6th grade	4
7th grade	5

Please write your teacher's name.

____

Please write the name of your school.

____

4. How many years have you been at this school?

Less than 1 year	1
2 years	2
3 years	3
4 years	4
5 years	5
6 years	6
7 years or more	7

What type of work does your father do? (Give a short description of his job.)

____

____

____

____

THE FOLLOWING QUESTIONS ARE TO BE ANSWERED BY CIRCLING THE NUMBER ON THE RIGHT OF THE CORRECT ANSWER. REMEMBER NO ONE WILL SEE YOUR ANSWERS.

5. If you could go as far as you wanted in school, how far would you like to go?

Finish grade school	1
Go to high school for awhile	2
Finish high school	3
Go to college for awhile	4
Finish college	5

6. Sometimes what you want to happen is not what you think will happen. How far do you think you will go in school?

Finish grade school	1
Go to high school for awhile	2
Finish high school	3
Go to college for awhile	4
Finish college	5

7. How many students in this school try hard to get a good grade on their weekly tests?

Almost all of the students	1
Most of the students	2
Half of the students	3
Some of the students	4
Almost none of the students	5

8. How many students in this school will work hard to get a better grade on the weekly tests than their friends do?

Almost all of the students	1
Most of the students	2
Half of the students	3
Some of the students	4
Almost none of the students	5

9. How many students in this school don't care if they get bad grades?

Almost all of the students	1
Most of the students	2
Half of the students	3
Some of the students	4
Almost none of the students	5

10. How many students in this school do more studying for weekly tests than they have to?

Almost all of the students	1
Most of the students	2
Half of the students	3
Some of the students	4
Almost none of the students	5

11. If most of the students here could go as far as they wanted in school, how far would they go?

Finish grade school	1
Go to high school for awhile	2
Finish high school	3
Go to college for awhile	4
Finish college	5

12. How important is it to you to be a good student?

Very important	1
Important	2
Somewhat important	3
Not very important	4
Not important at all	5

13. How important do most of the students in this class feel it is to do well in school work?

They feel it is very important	1
They feel it is important	2
They feel it is somewhat important	3
They feel it is not very important	4
They feel it is not important at all	5

14. How important do you think most of the students in this school feel it is to do well in school work?

They feel it is very important	1
They feel it is important	2
They feel it is somewhat important	3
They feel it is not very important	4
They feel it is not important at all	5

15. How many students in this class think reading is a fun thing to do and read even when they don't have to?

Almost all of the students	1
Most of the students	2
About half of the students	3
Some of the students	4
None of the students	5

16. How many students in this school make fun of or tease students who get real good grades?

Almost all of the students	1
Most of the students	2
About half of the students	3
Some of the students	4
None of the students	5

17. How many students don't do as well as they could do in school because they are afraid other students won't like them as much?

Almost all of the students	1
Most of the students	2
About half of the students	3
Some of the students	4
None of the students	5

REMEMEBER, PLEASE ANSWER THE FOLLOWING QUESTIONS BY CIRCLING THE NUMBER WHICH BEST ANSWERS THE QUESTION FOR YOU. PICK ONLY ONE ANSWER FOR EACH QUESTION.

18. How many students don't do as well as they could do in school because they are afraid their friends won't like them as much?

Almost all of the students	1
Most of the students	2
About half of the students	3
Some of the students	4
None of the students	5

19. How many students in this school would study hard if their work wasn't graded by the teachers?

Almost all of the students	1
Most of the students	2
About half of the students	3
Some of the students	4
None of the students	5

20. People like me will not have much of a chance to do what we want to in life.

Strongly agree	1
Agree	2
Disagree	3
Strongly Disagree	4

21. People like me will never do well in school even though we try hard.

Strongly agree	1
Agree	2
Disagree	3
Strongly Disagree	4

22. I can do well in school if I work hard.

Strongly agree	1
Agree	2
Disagree	3
Strongly Disagree	4

23. In this school, students like me don't have any luck.

Strongly agree	1
Agree	2
Disagree	3
Strongly Disagree	4

24. You have to be lucky to get good grades in this school.

Strongly agree	1
Agree	2
Disagree	3
Strongly Disagree	4

25. Think of your friends. Do you think you can do school work better, the same or poorer than your friends?

Better than all of them	1
Better than most of them	2
About the same	3
Poorer than most of them	4
Poorer than all of them	5

26. Think of the students in your class. Do you think you can do school work better, the same or poorer than the students in your class?

Better than all of them	1
Better than most of them	2
About the same	3
Poorer than most of them	4
Poorer than all of them	5

27. When you finish high school, do you think you will be one of the best students, about the same as most or below most of the students?

One of the best	1
Better than most of the students	2
Same as most of the students	3
Below most of the students	4
One of the worst	5

28. Do you think you could finish college?

Yes, for sure	1
Yes, probably	2
Maybe	3
No, probably not	4
No, for sure	5

29. If you went to college, do you think you would be one of the best students, same as most or below most of the students?

One of the best	1
Better than most of the students	2
Same as most of the students	3
Below most of the students	4
One of the worst	5

30. If you want to be a doctor or a teacher, you need more than four years of college. Do you think you could do that?

Yes, for sure	1
Yes, probably	2
Maybe	3
No, probably not	4
No, for sure	5

31. Forget how your teachers mark your work. How good do you think your own work is?

Excellent	1
Good	2
Same as most of the students	3
Below most of the students	4
Poor	5

32. What kind of grades do you think you really can get if you try?

Mostly A's	1
Mostly B's	2
Mostly C's	3
Mostly D's	4
Mostly F's	5

33. How far do you think your best friend believes you will go in school?

Finish grade school	1
Go to high school for awhile	2
Finish high school	3
Go to college for awhile	4
Finish college	5

NOW WE WOULD LIKE TO ASK SOME QUESTIONS ABOUT THE TEACHERS IN THIS SCHOOL. ANSWER THESE QUESTIONS AS YOU ANSWERED THE OTHER ONES BY CIRCLING THE NUMBER. REMEMBER, NO TEACHER WILL SEE YOUR ANSWERS, SO BE AS HONEST AS YOU CAN.

34. Of the teachers that you know in this school, how many tell students to try hard to do better on tests?

Almost all of the teachers	1
Most of the teachers	2
Half of the teachers	3
Some of the teachers	4
Almost none of the teachers	5

35. How many teachers in this school tell students to try and get better grades than their classmates?

Almost all of the teachers	1
Most of the teachers	2
Half of the teachers	3
Some of the teachers	4
Almost none of the teachers	5

36. Of the teachers that you know in this school, how many don't care if the students get bad grades?

Almost all of the teachers	1
Most of the teachers	2
Half of the teachers	3
Some of the teachers	4
Almost none of the teachers	5

37. Of the teachers that you know in this school, how many tell students to do extra work so that they can get better grades?

Almost all of the teachers	1
Most of the teachers	2
Half of the teachers	3
Some of the teachers	4
Almost none of the teachers	5

38. Of the teachers that you know in this school, how many make the students work too hard?

Almost all of the teachers	1
Most of the teachers	2
Half of the teachers	3
Some of the teachers	4
Almost none of the teachers	5

39. Of the teachers that you know in this school, how many don't care how hard the student works, as long as he passes?

Almost all of the teachers	1
Most of the teachers	2
Half of the teachers	3
Some of the teachers	4
Almost none of the teachers	5

40. How far do you think the teacher you like the best believes you will go in school?

Finish grade school	1
Go to high school for awhile	2
Finish high school	3
Go to college for awhile	4
Finish college	5

41. How good of a student does the teacher you like the best expect you to be in school?

One of the best	1
Better than most of the students	2
Same as most of the students	3
Not as good as most of the students	4
One of the worst	5

42. Think of your teacher. Would your teacher say you can do school work better, the same or poorer than other people your age?

Better than all of them	1
Better than most of them	2
Same as most of them	3
Poorer than most of them	4
Poorer than all of them	5

43. Would your teacher say that your grades would be with the best, same as most or below most of the students when you graduate from high school?

One of the best	1
Better than most of the students	2
Same as most of the students	3
Below most of the students	4
One of the worst	5

44. How often do teachers in this school try to help students who do badly on their school work?

They always try to help	1
They usually try to help	2
They sometimes try to help	3
They seldom try to help	4
They never try to help	5

45. Compared to students in other schools, how much do students in this school learn?

They learn a lot more in this school	1
They learn a little more in this school	2
About the same as in other schools	3
They learn a little bit less in this school	4
They learn a lot less in this school	5

46. Compared to students from other schools, how well will most of the students from this school do in high school?

They will be among the best	1
They will do better than most	2
They will do about the same as most	3
They will do poorer than most	4
They will be among the worst	5

47. How important is it to teachers in this school that their students learn their school work?

It is the most important thing to the teachers	1
It is very important to the teachers	2
It is somewhat important to the teachers	3
It is not very important to the teachers	4
It is not important at all to the teachers	5

48. Think about the teachers you know in this school. Do you think the teachers in this school care more, or less, than teachers in other schools about whether or not their students learn their school work?

Teachers in this school care a lot more	1
Teachers in this school care a little more	2
There is no difference	3
Teachers in this school care a little less	4
Teachers in this school care a lot less	5

49. Does your teacher think you could finish college?

Yes, for sure	1
Yes, probably	2
Maybe	3
Probably not	4
No, for sure	5

50. Remember you need more than four years of college to be a teacher or doctor. Does your teacher think you could do that?

Yes, for sure	1
Yes, probably	2
Maybe	3
Probably not	4
No, for sure	5

NOW WE WOULD LIKE YOU TO ANSWER SOME QUESTIONS ABOUT YOUR PARENTS. ANSWER THEM THE SAME WAY YOU ANSWERED THE OTHER ONES.

51. How far do you think your parents believe you will go in school?

Finish grade school	1
Go to high school for awhile	2
Finish high school	3
Go to college for awhile	4
Finish college	5

52. How good of a student do your parents expect you to be in school?

One of the best	1
Better than most of the students	2
Same as most of the students	3
Not as good as most of the students	4
One of the worst	5

53. Think of your parents. Do your parents say you can do school work better, the same or poorer than your friends?

Better than all of them	1
Better than most of them	2
Same as most of them	3
Poorer than most of them	4
Poorer than all of them	5

54. Would your parents say that your grades would be with the best, same as most or below most of the students when you finish high school?

One of the best	1
Better than most of the students	2
Same as most of the students	3
Not as good as most of the students	4
One of the worst	5

55. Do your parents think you could finish college?

Yes, for sure	1
Yes, probably	2
Maybe	3
No, probably not	4
No, for sure	5

56. Remember, you need more than four years of college to be a teacher or doctor. Do your parents think you could do that?

Yes, for sure	1
Yes, probably	2
No, probably not	3
No, for sure	4

READ EACH STATEMENT BELOW. CIRCLE THE NUMBER OF THE ANSWER THAT TELLS HOW OFTEN THE STATEMENT IS TRUE FOR YOU.

57. I can talk to other students while I work.

Always	1
Often	2
Sometimes	3
Seldom	4
Never	5

58. In class, I can move about the room without asking the teacher.

Always	1
Often	2
Sometimes	3
Seldom	4
Never	5

59. In class, I have the same seat and I must sit next to the same students.

Always	1
Often	2
Sometimes	3
Seldom	4
Never	5

60. When I am working on a lesson, the other students in my class are working on the same lesson.

Always	1
Often	2
Sometimes	3
Seldom	4
Never	5

61. In most of my classes, the teacher tells me what I must work on; I have no choice.

Always	1
Often	2
Sometimes	3
Seldom	4
Never	5

62. In class, the teacher stands in front of the room and works with the class as a whole.

Always	1
Often	2
Sometimes	3
Seldom	4
Never	5

63. If your teacher gave you a hard assignment, would you rather figure out how to do it by yourself or would you want your teacher to tell you how to do it?

I almost always prefer figuring it out for myself	1
I usually prefer figuring it out for myself	2
Sometimes I prefer figuring it out for myself	3
I usually like the teacher to tell me how to do it	4
I always like the teacher to tell me how to do it	5

64. When your teachers give you difficult assignments, do they usually give you too much help or not enough?

They almost always give too much help	1
They usually give too much help	2
They give just enough help	3
They usually don't give enough help	4
They almost never give enough help	5

65. Suppose you had some free time and wanted to do something fun but all your friends were busy and couldn't play with you. Do you think you could find something fun to do all by yourself?

Yes, it would be easy	1
Yes, if I tried hard	2
Maybe	3
No, probably not	4
No, it is never fun to be alone	5

66. Sometimes we are faced with a problem that at first seems **too** difficult for us to handle. When this happens, how often do you try to solve the problem all by yourself instead of asking someone for help?

Always	1
Most of the time	2
Sometimes	3
Not very often	4
Never	5

67. Some people enjoy solving problems or making decisions all by themselves, other people don't enjoy it. Do you like to solve problems all by yourself?

I almost always like to	1
I usually like to	2
I like to sometimes	3
I usually don't like to	4
I almost never like to	5

APPENDIX D

Comparison of Findings with Des Moines' Actual Allocation

INTRODUCTION

This document represents the second in a series of reports detailing the results of a year long study funded by a grant from the National Institute of Education, directed at monitoring student academic engagement rates within the normal classroom setting. The first report discussed the impetus and rationale of the study; the selection and training of the cadre of classroom observers; school and student selection; an explanation of the observation process; and finally a report of findings of student engagement rates in grades two through six for all subject areas.

This second report focuses upon a comparison between the school district's recommended guidelines for weekly time allotments in all subject areas for grades two through six, and the actual observed time spent in the teaching of these subject areas. Eighty classrooms, sixteen classrooms per grade level for grades two through six, at the eight participating buildings were observed over the course of the entire 1980-81 school term, comprising a total of four hundred fifty-two full day observations. (Table 1 contains descriptive information regarding the observation period.) Observations were interspersed among the days of the week over the entire school year to provide reasonable coverage of varying school activities, particularly instructional variations that occur on a daily basis.

It is important that the reader clearly understand that one of the major criticisms leveled against studies of this nature has been directed at the limited number of days of observation upon which generalizations have been made. William W. Cooley, of the University of Pittsburgh, after reviewing much of the research reported relevant to time-on-task, noted that "general classroom research is not obtaining reasonable estimates of instructional time due to the large number of variables being measured and to the small amount of time being sampled."[1] Of the studies reviewed by Cooley, the longest observation period was reported to be eight weeks; this figure is somewhat misleading because it does not reflect a total number of days observed, but the period over which observations were conducted. In addition, the vast majority of studies conducted were undertaken at two grade levels (often second and fifth grades) involving a small sample of students observed in only two subject areas, reading and mathematics. As a result of Cooley's examination of the methodological flaws inherent to the extant research conducted he recommended, among other cautions, to:

> Sample as much instructional time as funds permit so as to have more power of generalization. Research on the amount of total instructional time sampled is necessary in order to give us confidence in making generalizations to an entire school year.[2]

The recommendations of Cooley have been carefully considered during the course of this study and the magnitude of the observation periods conducted, as reported in Table 1, support the accuracy of the findings reported pertinent to the Des Moines Independent Community School District.

TABLE 1

Descriptive Information of Time-on-Task Observation Period

Grade	Number of Class-rooms Observed	Number of Students Observed	Total Number of Full Day Observations	Total Number of Hours Observed	Percent of School Year
2	16	64	95	522.5	52%
3	16	64	93	511.5	51%
4	16	64	88	484.0	49%
5	16	64	85	467.5	47%
6	16	64	91	500.5	50%

REPORT OF FINDINGS

Tables 2 through 13 detail the results of the average number of minutes observed in each subject area, by grade, on a weekly basis. Tables 2 through 6 provide a comparison within each grade level, across all subject areas, of the average number of minutes devoted to each subject area relative to the district's recommended time allotments. Tables 7 through 13 provide a comparison across all grade levels for a given subject area of average observed time on a weekly basis versus the district's recommended weekly allotments.

Referring to Table 2, "Average Number of Minutes Observed in Each Subject Area for Second Grade," five categories of information are presented: 1) the average weekly observed time in minutes; 2) the average weekly observed time in minutes adjusted for transition time; 3) the district's weekly recommended allotment in minutes, 4) the average weekly deviation of observed to recommended time in minutes; 5) weekly deviation adjusted for transition time. Transition time is defined as the time between activities when students are engaged in putting a completed activity away and getting materials for a new activity, or moving from one area (room) to another. Transition time was recorded under the activity students were transitioning to; consequently, the need to adjust observed time to reflect time devoted strictly to instruction.

For example, in mathematics the average weekly observed time at the second grade is 207 minutes (196 minutes when corrected for transition time). The district recommends a weekly allotment of 150 minutes be devoted to the instruction of mathematics. This represents an average difference of +46 minutes corrected for transition; i.e., on the average 46 minutes more per week is devoted to the instruction of mathematics. In reading at the second grade level 408 minutes, on the average, are devoted to weekly instruction of reading as compared to 600 minutes of recommended time. This represents an average difference of -192 minutes; i.e., on the average 192 minutes less per week is devoted to the instruction of this subject. Consequently, the addition of more time to a particular subject results in the taking away of time from other areas. The final figure reported under the Average Weekly Deviation column represents the average weekly time associated with nonacademic time, such as the teacher being involved in the collection of lunch money, taking attendance, etc., and not transition activities (see Report I for a complete description of these categories). Thus, at second grade an average of 175 minutes per week (274 minutes when corrected for transition) is taken up by nonacademic activities, an average of 35 minutes per day (or 55 minutes per day if one choses to treat transition time as a nonacademic activity); i.e., time not devoted to academic undertakings. (Note, these figures have been adjusted for recess and lunch breaks, thus it reflects the amount of time taken away from available instructional time.) All information reported in the remainder of the tables in this section are interpretable in the same fashion.

Upon examination of the data presented in the tables, one notes that the greatest discrepancies between observed and recommended times are associated with the areas of reading and language arts. Although both areas were specifically defined for observational purposes (see Report I) it is difficult, from a practical standpoint, to treat both activities as mutually exclusive. Table 11A reflects total recommended and observed instructional times for reading and language combined. A final note accompanying the interpretation of the data appearing in the tables is associated with the figures reported in parenthesis for science and social studies, and fine arts (representing music and art instruction). These figures represent the average total weekly observed time allotments to facilitate comparisons with the district's total allotments for these areas. The district breaks out recommended time allotments for neither science and social science nor art and music individually, but recommends a block of time for each of these two areas. (See Appendix A, Guidelines for Weekly Time Allotments.) Consequently, the reader is provided with an average observed time for each of these four subjects individually, and an average total observed time for these two groupings to facilitate comparisons.

Tables 7 through 13 present the data appearing in Tables 2 through 6 in a slightly different configuration. Information is detailed by subject area in order to facilitate comparisons across grade levels, as opposed to comparisons within a grade level across subject areas. Once again the data is presented in terms of average observed and recommended weekly allotments in minutes with differences between these two quantities representing average weekly differences in minutes. In addition, Table 14 consolidates the weekly average observed times associated with nonacademic undertakings across the five grade levels. Recall that the minuses preceeding each number present the average time lost from scheduled instructional time.

TABLE 2

Average Number of Minutes Observed in each Subject Area

For Second Grade

Subject	Average Weekly Observed Time in Minutes		Average Weekly Observed Time in Minutes Adjusted for Transition Time	District Weekly Recommended Allotment in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time
Mathematics	207		196	150	+57	+46
Science	15	(85)[1]	74	175	-90	-101
Social Studies	70					
Health	50		46	25	+25	+21
Reading	438		408	600	-162	-192
Language Arts	413		388	250	+163	+138
Physical Ed.	24		22	100	-76	-78
Music	65	(108)[1]	92	200	-92	-108
Art	43					
Nonacademic Time					-175	-274

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[1] Represents total weekly average for science and social studies, music and art.

TABLE 3

Average Number of Minutes Observed in each Subject Area For Third Grade

Subject	Average Weekly Observed Time in Minutes	Average Weekly Observed Time in Minutes Adjusted for Transition Time	District Weekly Recommended Allotment in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time
Mathematics	198	185	175	+23	+10
Science	21 (111)[1]	101	175	-64	-74
Social Studies	90				
Health	64	60	25	+39	+35
Reading	332	308	575	-243	-267
Language Arts	443	415	250	+193	+165
Physical Ed.	48	43	100	-52	-57
Music	84 (143)[1]	117	200	-57	-83
Art	59				
Nonacademic Time				-161	-271

[1] Represents total weekly average for science and social studies, music and art.

TABLE 4

Average Number of Minutes Observed in each Subject Area

For Fourth Grade

Subject	Average Weekly Observed Time in Minutes	Average Weekly Observed Time in Minutes Adjusted for Transition Time	District Weekly Recommended Allotment in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time
Mathematics	215	202	250	-35	-48
Science	66 (210)[1]	186	250	-40	-64
Social Studies	144				
Health	77	72	70	+7	+2
Reading	240	223	350	-110	-127
Language Arts	448	422	250	+198	+172
Physical Ed.	98	88	180	-82	-92
Music	84 (143)[1]	113	250	-107	-137
Art	59				
Nonacademic Time				-169	-294

[1] Represents total weekly average for science and social studies, music and art.

TABLE 5

Average Number of Minutes Observed in each Subject Area

For Fifth Grade

Subject	Average Weekly Observed Time in Minutes		Average Weekly Observed Time in Minutes Adjusted for Transition Time	District Weekly Recommended Allotment in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time
Mathematics	251		237	250	+1	-13
Science	43	(225)[1]	204	250	-25	-46
Social Studies	182					
Health	80		75	70	+10	+5
Reading	280		264	350	-70	-86
Language Arts	312		289	250	+62	+39
Physical Ed.	126		115	180	-54	-65
Music	116	(202)[1]	167	250	-48	-83
Art	86					
Nonacademic Time					-124	-249

[1] Represents total weekly average for science and social studies, music and art.

TABLE 6

Average Number of Minutes Observed in each Subject Area

For Sixth Grade

Subject	Average Weekly Observed Time in Minutes		Average Weekly Observed Time in Minutes Adjusted for Transition Time	District Weekly Recommended Allotment in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes	Weekly Average Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time
Mathematics	246		236	250	-4	-14
Science	71	(218)[1]	197	250	-32	-53
Social Studies	147					
Health	69		66	70	-1	-4
Reading	206		195	350	-144	-155
Language Arts	368		349	250	+118	+99
Physical Ed.	137		126	180	-43	-54
Music	99	(214)[1]	182	250	-36	-68
Art	115					
Nonacademic Time					-142	-249

[1] Represents total weekly average for science and social studies, music and art.

TABLE 7

Observed and Recommended Time Allotments Across Grade Levels For Mathematics

	Grade Level				
	2	3	4	5	6
District Weekly Recommended Allotment in Minutes	150	175	250	250	250
Average Weekly Observed Time in Minutes	207	198	215	251	246
Average Weekly Observed Time in Minutes Adjusted for Transition Time	196	185	202	237	236
Average Weekly Deviation of Observed to Recommended Time in Minutes	+57	+23	-35	+1	-4
Average Weekly Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time	+46	+10	-48	-13	-14

TABLE 8

Observed and Recommended Time Allotments Across Grade Levels For Science and Social Science

	Grade Level				
	2	3	4	5	6
District Weekly Recommended Allotment in Minutes	175	175	250	250	250
Average Weekly Observed Time in Minutes	85	111	210	225	218
Average Weekly Observed Time in Minutes Adjusted for Transition Time	74	101	186	204	197
Average Weekly Deviation of observed to Recommended Time in Minutes	-90	-64	-40	-25	-32
Average Weekly Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time	-101	-74	-64	-46	-53

TABLE 9

Observed and Recommended Time Allotments Across Grade Levels For Health

	Grade Level				
	2	3	4	5	6
District Weekly Recommended Allotment in Minutes	25	25	70	70	70
Average Weekly Observed Time in Minutes	50	64	77	80	69
Average Weekly Observed Time in Minutes Adjusted for Transition Time	46	60	72	75	66
Average Weekly Deviation of Observed to Recommended Time in Minutes	+25	+25	+7	+10	-1
Average Weekly Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time	+21	+35	+2	+5	-4

TABLE 11

Observed and Recommended Time Allotments Across Grade Levels For Language Arts

	Grade Level				
	2	3	4	5	6
District Weekly Recommended Allotment in Minutes	250	250	250	250	250
Average Weekly Observed Time in Minutes	413	443	448	312	368
Average Weekly Observed Time in Minutes Adjusted for Transition Time	388	415	422	289	349
Average Weekly Deviation of Observed to Recommended Time in Minutes	+163	+193	+198	+62	+118
Average Weekly Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time	+138	+165	+172	+39	+99

TABLE 10

Observed and Recommended Time Allotments Across Grade Levels

For Reading

	Grade Level				
	2	3	4	5	6
District Weekly Recommended Allotment in Minutes	600	575	350	350	350
Average Weekly Observed Time in Minutes	438	332	240	280	206
Average Weekly Observed Time in Minutes Adjusted for Transition Time	408	308	223	264	195
Average Weekly Deviation of Observed to Recommended Time in Minutes	-162	-243	-110	-70	-144
Average Weekly Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time	-192	-267	-127	-86	-155

TABLE 11A

Observed and Recommended Time Allotments Across Grade Levels

For Reading and Language Arts Combined

	Grade Level				
	2	3	4	5	6
Combined Weekly Recommended Time Allotment	850	825	600	600	600
Combined Average Weekly Observed Time in Minutes	851	775	688	592	574
Combined Average Weekly Observed Time in Minutes Adjusted for Transition Time	796	723	645	553	544
Combined Average Weekly Deviation	+1	-50	+88	-8	-26
Combined Average Weekly Deviation for Transition Time	-54	-102	+45	-47	-56

TABLE 12

Observed and Recommended Time Allotments Across Grade Levels For Physical Education

	Grade Level				
	2	3	4	5	6
District Weekly Recommended Allotment in Minutes	100	100	180	180	180
Average Weekly Observed Time in Minutes	24	48	98	126	137
Average Weekly Observed Time in Minutes Adjusted for Transition Time	22	43	88	115	126
Average Weekly Deviation of Observed to Recommended Time in Minutes	-76	-52	-82	-54	-43
Average Weekly Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time	-78	-57	-92	-65	-54

TABLE 13

Observed and Recommended Time Allotments Across Grade Levels For Fine Arts (Music and Art)

	Grade Level				
	2	3	4	5	6
District Weekly Recommended Allotment in Minutes	200	200	250	250	250
Average Weekly Observed Time in Minutes	108	143	143	202	214
Average Weekly Observed Time in Minutes Adjusted for Transition Time	92	117	113	167	182
Average Weekly Deviation of Observed to Recommended Time in Minutes	-92	-57	-107	-48	-36
Average Weekly Deviation of Observed to Recommended Time in Minutes Adjusted for Transition Time	-108	-83	-137	-83	-68

TABLE 14

Weekly Average Nonacademic Observed Times Reported in Minutes

By Grade Level

	Grade Level				
	2	3	4	5	6
Weekly Average	-175	-161	-169	-124	-142
Weekly Average Adjusted for Transition Time	-274	-271	-294	-249	-249
Daily Average	-35	-32	-34	-25	-28
Daily Average Adjusted for Transition Time	-55	-54	-59	-50	-50

INTREPRETATION AND IMPLICATIONS

Recalling that all data reported in the preceeding tables represent weekly time deviations, the reader can simply divide the appropriate figure by five to arrive at a daily assessment of average times devoted to or taken away from various subject areas. A careful consideration of Table 14 will illustrate this point. The average weekly observed times associated with nonacademic endeavors were each divided by five to reflect a daily average. Thus the reader should ask himself whether 35 (uncorrected for transition time) minutes on the average devoted to nonacademic concerns at the second grade level, collecting lunch money, taking role, etc., is too much time being occupied by these concerns, or whether it is about right. No one would disagree with the contention that these activities must be accomplished; however, the agreement is not about whether they should be done but with how they are done. Different methods accomplish the same purpose but some are more inefficient; i.e., more time consuming, than others. Examining the data on either a daily or weekly basis might provide a very optimistic picture. However, extending the picture to a school year of 181 days, 35 minutes, results in approximately 106 "lost" hours for a school year or approximately 4 lost full school days.

This second report was designed to provide the district's administrative and instructional staff with a clear objective assessment of instructional time that could provide a basis for future scheduling determinations. It is clear from all the data reported in the tables that there exists a marked difference between the district's recommended time allotments and the actual observed time devoted to a subject area. The most striking discrepancies exist in the areas of reading and language arts instruction. Consistently, across all grade levels, the amount of observed time devoted to reading is substantially less (see Table 10) than the recommended district allotment. Correspondingly, the amount of observed time devoted to language arts is substantially more than the recommended time (see Table 11). This discrepancy, as noted in the previous section, could be artifactual in nature due to the definitions furnished the observer (see Report I); however, this discrepancy is viewed as having a minimal impact upon the results reported.

Although all subject areas investigated reveal discrepancies in terms of recommended versus actual observed times devoted to instruction, with reading and language arts exhibiting the largest deviations, a major question necessitating a response to this condition is, "Are the district recommended allotments appropriate for reading and language arts or are the reported observed times more reasonable?" A second area necessitating careful consideration by the appropriate subject area supervisors is the observed times devoted to science and social studies at each of the grade levels.

As indicated previously, the district recommends a total time allotment for both science and social studies combined, essentially relying on teacher judgment as to how the time should be spent on each area individually. As detailed in Tables 2 through 6, it is clear that considerably more time is devoted on a weekly basis to the instruction of social studies vis á vis science. Consequently, "does the district consider the appropriation of time by the classroom teacher reasonable in the case of science and social studies instruction, or should the district elect to recommend individual time allotments for each of these areas?", that is, assume a more directive posture.

This document was specifically designed to serve as a working paper upon which future discussions regarding scheduling and curriculum decisions could and should be based. Implications relevant to the total school program as well as individual subject areas can only be considered in terms of the individual viewpoints of those involved in this process. The intent of this paper is to stimulate these discussions by providing valid, objective data detailing information crucial to these deliberations. The next report in this series will focus upon the variety of instructional strategies employed by teachers in the various subject areas eventually leading to those strategies which maintains the highest student engagement rates.

NOTES

[1] Lomax, R. G., Cooley, W. W. The Student Achievement--Instructional Time Relationship. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA, April, 1979, pp. 4-5.

[2] Ibid, p. 16.

APPENDIX A

DISTRICT GUIDELINES FOR WEEKLY TIME ALLOTMENTS

Grades K-6

	Kdg.	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 5	Gr. 6
Homeroom--planning	50	50	50	50	50	50	50
Recess (2 ten minute periods		100	100	100			
Reading (literature and skills and use of library	150	700	600	575	350	350	350
Language Arts	100	175	250	250	250	250	250
Social Studies Science	100	175	175	175	250	250	250
Arithmetic	100	125	150	175	250	250	250
Health		25	25	25	70	70	70
Physical Education or Free Play (Kdg.) Physical Education (gr. 1-6)	100	100	100	100	180	180	180
Fine Arts (art and music)	100	200	200	200	250	250	250
Worktime Choice Rest or Relaxation Clean-up Evaluation	150						
Total	850	1650	1650	1650	1650	1650	1650

APPENDIX E

Project Dissemination

Project Dissemination

Results of this project have been disseminated to over 500 teachers, administrators, and central office staff via half day inservice activities. Although we have no way of gaging the extent to which our findings have been applied by these individuals, informal conversations with many of these educators and more formal contact with ongoing curriculum committees in both school districts (Wheaton and Des Moines) indicate that this project has had a positive impact. In addition, we have received requests and have mailed over 100 individual copies of the two preliminary papers (which were an outgrowth of the initial findings) to over 30 states and five foreign countries. We anticipate a similar interest in this final report. To date, two formal papers have been generated as a result of this project and are listed below.

Ebmeier, H. and Ziomek, R. Increasing engagement rates of low and high achievers. Paper presented at the annual meeting of the American Educational Research Association, New York, 1982.

Ebmeier, H., and Ziomek, R. Engagement rates as a function of subject area, grade level, and time of day. Paper presented at the annual meeting of the American Educational Research Association, New York, 1982.